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Field Guide
to
Northeastern Longhorned Beetles
(Coleoptera: Cerambycidae)

Douglas Yanega

Illinois Natural History Survey
Manual 6

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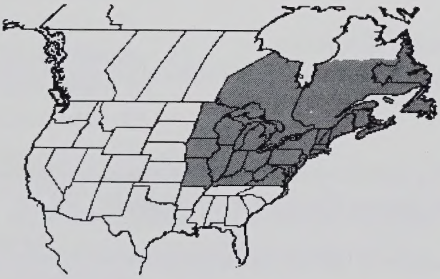

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FOREWORD

This field guide was begun as part of the Critical Trends Assessment Project developed in part by the Illinois Natural History Survey. One of the phases of this project called for the development of tools and protocols by which concerned citizens could directly contribute to scientifically sound biomonitoring efforts in the state of Illinois. In working on such a set of protocols for woodlands, it became obvious that there are few organisms other than plants that are routinely used for forest biomonitoring in North America. The goals of forest biomonitoring are best served by working with organisms that have strong ecological ties to woodlands, that can be sampled adequately and recognized to species, and that are diverse enough in habits and distribution so their patterns of occurrence and abundance are likely to convey useful information about the habitat in which they are encountered. After careful consideration, I decided upon the longhorned beetles (Cerambycidae) as one of the animal groups with the greatest unexplored potential for use in nonprofessional forest biomonitoring efforts.

Accordingly, this field guide is explicitly designed as a tool for nonentomologists. It presents the minimum amount of information necessary to enable the reliable identification to species of *all* of the Cerambycidae of northeastern North America (to make the end product useful over a greater area than Illinois alone; the boundaries set here are the best political-boundary approximation of a functional ecological boundary, in terms of disjunctions between regional faunas). Other field guides (such as White 1983) give more detailed descriptions of techniques for collecting and preserving beetles, as well as principles of classification. Other references include detailed discussions of the life histories of certain species, and typically focus on those of economic importance. I have omitted much of this material here (directing the reader to other sources) to reduce redundancy; the primary goal is to make this guide sufficient for the task of species-level identification, but still affordable and portable. This guide is the first to illustrate all northeastern species of Cerambycidae (except one, which has not yet been described). Previous to this, the most comprehensively illustrated, portable works covering Cerambycidae of this region were Knull's (1946) treatise on Ohio species and Dillon and Dillon's (1972) *A Manual of Common Beetles of Eastern North America*. Newer references have tended to be either unwieldy or expensive, too limited in coverage of species, or inadequately illustrated. I define the "Northeast" more broadly than Downie and Arnett (1996), and have also compiled more recent references, and so have several more species included here, as well as more updated taxonomy and nomenclature.

Given that I have written for the benefit of nonentomologists and have also illustrated every species, I do not utilize the traditional dichotomous identification keys familiar to many readers because it is far more efficient to simply allow the user of the guide to make a quick visual match and then use selected diagnostic features to confirm the identification. Virtually all of the species herein possess distinctive diagnostic features visible with either the unaided eye or with nothing more powerful than a 10X magnification hand lens (this was, in fact, a prime reason for selecting Cerambycidae as potentially useful in biomonitoring).

One of the goals of a field guide should be to allow the investigator to distinguish between significant and trivial information about a species. I have *intentionally* limited the amount of information presented herein in accordance with the intended utility. Detailed maps of known collection localities for each species are not given, nor graphs of seasonal phenologies, nor complete listings of all known plant hosts. Simply put, to do so would potentially imply that such listings as we presently possess are exhaustive, when in reality our knowledge of the geographic distributions, phenologies, and host relationships are based on so little material that any such implications would be presumptuous and misleading. That a species such as *Saperda calcarata* has no published records of occurrence in Virginia, for example, may be ultimately trivial, for it undoubtedly can be found there. In fact, it would not be a surprise to encounter this species anywhere in North America where willows or cottonwoods occur. Plants and animals do not recognize political boundaries, and I do so here only for expediency. One also cannot distinguish effectively (given the limited information available) between species for whom "extralimital" records *would* be biologically meaningful and those for which they would not. I therefore do not even attempt to make such a distinction, and feel such matters are best left to specialists engaged in research focused on biogeography.

Likewise, to find a species such as *Parandra brunnea*, recorded from over a dozen plant genera, on a "new" host is also effectively a trivial discovery as this beetle exhibits little if any host specificity. Bearing in mind that the question about a species' ecological role can perhaps be simplified to "What does it *mean* that this species occurs here and feeds on this plant?", then for any such generalist, widespread species, to state that its range is "eastern North America" and that its larvae feed on "various hardwoods and shrubs" is an efficient and adequate description. Especially troublesome are the many species whose identities have been confused over the decades, and species that were originally considered one species but have since been divided into two or more distinct entities. Published data on such species, especially host records, are generally impractical, if not impossible, to confirm, and may well be in error; when a host record is given in this guide, therefore, it is one that is presumed to be trustworthy, but there is always a chance for error.

If any readers have genuine need of such detailed information, extensive citations from the pertinent primary scientific literature are given in the bibliography. In particular, I must acknowledge that the superlative series of publications by E. Gorton Linsley and John A. Chemsak, which make up the monograph *The Cerambycidae of North America,* supplied much of the information upon which this guide is based, and these are doubtless the first resources readers should seek out if they are in need of further information. With rare exceptions, I have adopted Linsley and Chemsak's taxonomy and classification here, modified only by subsequent works by other authors, especially the recent classification of Lawrence and Newton (1995) and my own research (with special acknowledgment of the advice of Serge Laplante of Agriculture and Agri-Food Canada on the genus *Oberea*; see Appendix). Further, some spellings of species epithets in the literature are incorrect by the present rules of the International Code of Zoological Nomenclature, and are here restored to the original, valid spellings (*Stenocorus schaumii*, *Oberea schaumii*, *Dorcaschema wildii*, and *Aegomorphus morrisii*). There are two species mentioned in this guide that have not yet been named (*Phymatodes* sp. and *Purpuricenus* sp.), but the records for both have been published previously by other authors (Laplante 1989 and MacRae 1993, respectively).

A final word should be added about the preparation of the color plates for this guide. I originally took all images as color slides on Fujichrome Velvia 50 film using an Olympus OM-2 camera with bellows, fixed-focus 60 or 120 mm macro lenses, and paired flash attachment. The first 400 of these slides were then scanned into digital format on Kodak PhotoCD by Lazerquick Images (Wilsonville, OR), and edited by John Wieczorek, Jr., using Adobe Photoshop 3.0 in order to homogenize the backgrounds, including the removal of shadows and supporting points. I processed additional slides using similar equipment at the Illinois Natural History Survey. Also, I performed further adjustments to the resulting image files, such as fine-tuning of contrast and color, plus minor cosmetic corrections, using Adobe Photoshop. The final images were cropped and reduced (with help from Charles Warwick), and placed into PageMaker 6.0 along with the text. Numbers, scale bars, and diagnostic arrowheads were added in PageMaker, and the resulting files (and the color separations created in PageMaker) were then given directly to the printer.

Douglas Yanega

Champaign, Illinois
August 22, 1996

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INTRODUCTION

The Cerambycidae (pronounced "ser-am-BISS-i-dee"), or longhorned beetles, are one of the larger insect families, with some 20,000 described species (and thousands more undescribed) worldwide, from all continents except Antarctica. Larvae of almost all of these species bore within and feed upon plant tissues, the majority in decaying wood, but many will feed on living plants, both woody and herbaceous. Generally, cerambycids attack the branches, trunk (sometimes just the bark), or stem, but several species bore within the roots (sometimes venturing into the soil), and a few will even feed within cones, fruits, or seeds. The pattern of larval feeding damage, and even the type of waste fragments (or frass) produced is often of a characteristic nature for a given species or genus. Many species feed on plants of economic importance, especially timber, and are thus of interest to agriculture and silviculture. The adults tend to be relatively large among insects, including some species in excess of 150 mm (roughly 6 inches), though some can be as small as 2 mm (about 1/16 inch), and many are brightly colored or elaborately sculptured, so they are quite popular among insect collectors. The large size and variety of coloration and sculpture of longhorned beetles make them a relatively easy group of insects to identify, especially considering the number of species (some 1,100 species estimated in North America excluding Mexico); this guide attempts to exploit this. This guide includes over 600 color images, covering 342 of the 344 species and subspecies of longhorned beetles that have been definitively recorded in northeastern North America (defined here as that area east of roughly 95° W longitude and north of roughly 37° N latitude, using state/province boundaries), along with diagnostic features to enable recognition of all these species, as well as data on distribution, phenology, and larval feeding habits. Also included are a few species that might occur in the area, but whose presence has not yet been confirmed. It is hoped that by enabling recognition of such a diverse group of plant-feeding insects, this guide will facilitate biological monitoring efforts, in addition to providing a valuable tool aiding both amateur and professional entomologists in the identification of this beetle family. With this tool now available, we may come to have a better understanding of the distribution and ecology of many of these beetles, and therefore a better knowledge of our environment. Since this guide is primarily intended as an identification aid, those sections describing general ecology, natural history, economic importance, collection and preservation, and so on, are somewhat abbreviated, and the interested reader is referred to more detailed sources of information listed in the bibliographies.

CHAPTER 1: How to Use This Book

MORPHOLOGY AND TERMINOLOGY

The first step to using this guide is to become familiar with the specialized terminology used to describe the structure of insects. Only the essentials for understanding the external anatomy of adult beetles are presented here, and readers interested in other features (such as wing venation, musculature, and internal anatomy) can find numerous helpful references listed in the general bibliography section. Terms relating to biology and natural history will be discussed in the appropriate sections of the guide.

Orientation and Anatomical Position

anterior: toward the front or head end
posterior: toward the rear or tail end
dorsal: toward the upper surface or back
ventral: toward the lower surface or belly
lateral: toward the side or outer margin
medial: toward the midline of the body
longitudinal: oriented along the long axis of the body (anterior-posterior)
transverse: oriented perpendicular to the long axis of the body
oblique: oriented diagonally relative to the long axis of the body
basal: that portion of a structure closest to the center of the body; for present purposes, consider the scutellum to be the center of a beetle's body (for example, the base of an elytron is that portion near the scutellum, abutting the base of the pronotum).
apical: that portion of a structure farthest away from the center of the body (the apex, plural = apices)

Note: These terms can be combined and conjugated for more specific designations, such as dorso-lateral, postero-ventral, and so on.

General Structural Features

Insects possess a body wall (the **integument**) composed of an inner layer of living **epidermal cells**, which secrete an outer layer called the **cuticle**. The cuticle is composed of **chitin** (a complex nitrogenous sugar) and proteins, and is variously modified, both internally and externally, to form virtually all of the hard structures of the body, including many of the membranes. The **exoskeleton** is the portion of the cuticle that makes up the outer body wall, and while chitin is not itself rigid, a process of chemical hardening (known as **sclerotization**) converts portions of the outer cuticle into a rigid substance called **sclerotin**, subdividing the exoskeleton into platelike hardened areas (called **sclerites**) joined by tough, flexible membranes. At various points, epidermal cells may be modified to form hairs (or **setae**) that project through the cuticle. If a sclerite itself is in the form of a spine (i.e., a spine with a membranous base so it is movable) it is called a **spur**.

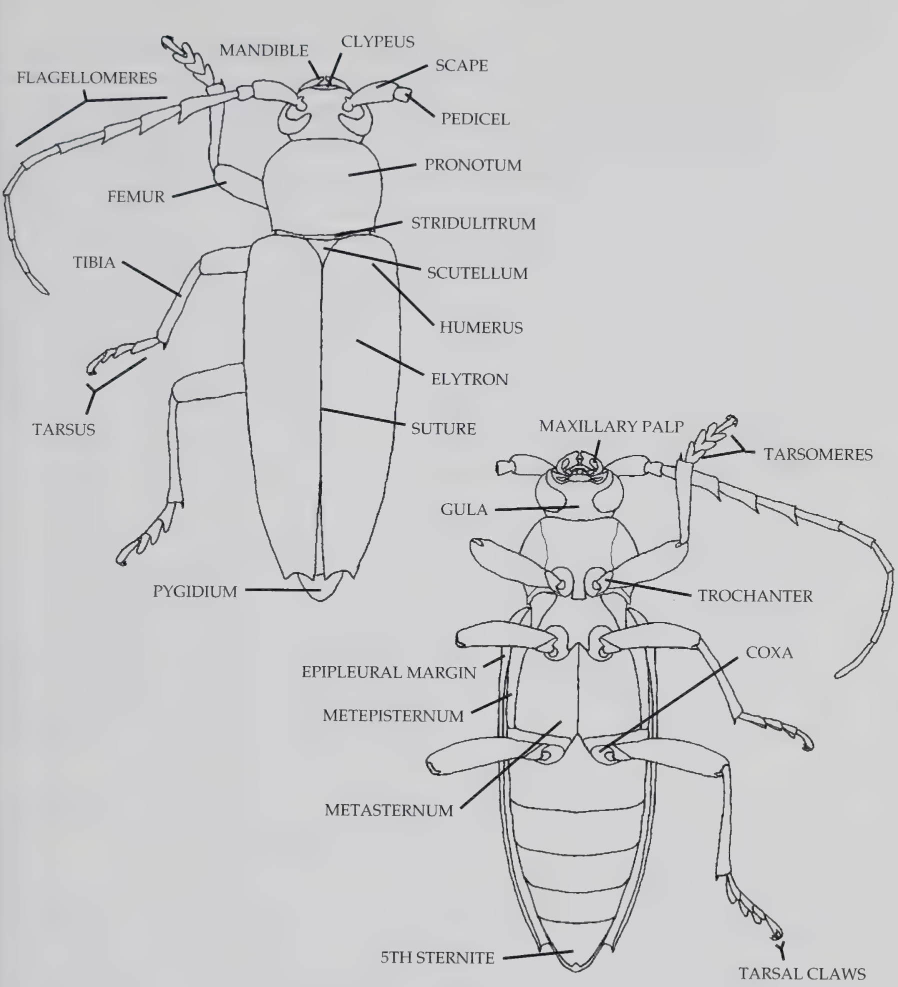
The internal portion of the cuticle, called the **endoskeleton**, involves a number of internal braces (varying from fingerlike to archlike or platelike) giving structural support and places for muscle attachment, as well as forming parts of the digestive tract. When an insect grows and needs a larger cuticle, the inner layers of the cuticle are resorbed, and a new cuticle is secreted underneath the old outer layer (including the endoskeletal portion), which is then shed in its entirety (a process called **ecdysis**, or molting); the new cuticle then expands and hardens. In insects such as beetles, the molt from pupa to adult is the last such event in the life cycle.

The Body Plan

The insect body has three functional regions (or **tagmata**), each composed of multiple segments. These are the **head**, **thorax**, and **abdomen**, and I will discuss details of each in turn, as they appear in cerambycid beetles (see figure, next page).

HEAD: The modern insect head is a single capsule supported by internal braces (called **apodemes**), and composed of several fused segments, recognizable now only by the paired appendages of each ancestral segment. The first of these are the **antennae**, which in cerambycids normally have 11 or 12 segments. The first antennal segment is often relatively large and is known as the **scape**, while the second is much smaller and is known as the **pedicel**. The remaining segments are sometimes collectively called the **flagellum** (individually called **flagellomeres**, so the "1st flagellomere" is the third antennal segment, and so on). In cerambycids, the basal socket of the scape is inserted in a projection on the **frons**, or face. This bulging projection often partially (or completely) divides the **compound eyes** into upper and lower lobes. A suture below the frons delimits a region called the **clypeus**, below which is a separate sclerite called the **labrum**. The labrum is attached at its base to the clypeus and serves as if it were an "upper lip." Behind the labrum are the paired **mandibles**, which are the relatively massive, primary jaws. Behind the mandibles is another pair of appendages, the **maxillae** (singular = **maxilla**), which have segmented **maxillary palpi** (singular = **palpus** or **palp**), and behind the maxillae is the **labium**, which also bears a pair of **labial palpi** and serves as a "lower lip." The ventral region of the head behind the labium is called the **gula** or **postgena**, the area between the lower margin of the compound eyes and the base of the mandibles is called the **malar space**, the area behind the eyes is called the **gena**, and the top of the head is called the **vertex**.

THORAX: All insects possess three thoracic segments, though in adult beetles only the most anterior of these, the **prothorax**, is freely articulated, while the remaining two (the **mesothorax** and **metathorax**, respectively) are firmly joined to the abdomen. Each segment ventrally has a pair of legs, each of which is subdivided into nine segments; the **coxa** is the basal articulation, followed by the **trochanter**, which is fused to the base of the **femur**, followed by the **tibia** and a five-segmented **tarsus** (plurals = **coxae, femora, tibiae, tarsi**). Spurs are often present at the apex of the tibia, while the last of the tarsal segments (called **tarsomeres**) bears a pair of claws, which are often cleft apically into



"teeth." Furthermore, in cerambycids the ventral surface of the tarsomeres often has dense pads of setae, and the fourth tarsomere is often extremely small and either hard to see or completely hidden at the base of the fifth tarsomere. With most structures found on a thoracic segment, the prefixes pro-, meso-, and meta- are used to distinguish which segment is involved, but the less formal modifiers fore-, mid-, and hind are often used when describing legs and leg segments (e.g., forecoxa, mid-femur, hind tarsi). The single central, ventral sclerite of each segment is called a **sternum**, so there is a **prosternum**, a **mesosternum**, and a **metasternum**. Ventro-laterally are sclerites called **pleura** (singular = **pleuron**), which themselves are sometimes subdivided into an anterior **episternum** and posterior **epimeron**. For a number of cerambycids it is helpful to recognize the features of the metasternum or metepisternum in order to separate species.

Dorsally, the three thoracic segments are quite different from one another. The **pronotum** is the entire dorsal region of the prothorax, while much of the **mesonotum** is hidden from view. The anterior edge of the mesonotum inserts below the base of the pronotum, and in cerambycids often possesses a region of microscopic transverse grooves called a **stridulitrum**. When the posterior edge of the pronotum is rubbed against this area by the beetle, a sound is produced, typically audible as a squeak or chirp. The mesonotum also bears the first pair of wings, which are modified and sclerotized in beetles to form the **elytra** (singular = **elytron**), or wing covers. The outer angle of the elytral base is known as the **humerus**, the outer margin below the humerus is the **epipleural margin**, and the midline between the elytra is known as the **suture**. At the base of the elytra is a small sclerite called the **scutellum**. The **metanotum** is hidden beneath the closed elytra and bears the second, membranous pair of wings, which are typically folded and concealed beneath the elytra when the beetle is not in flight.

ABDOMEN: The abdomen is composed of nine segments, only five of which are typically visible externally, while the others are reduced and form much of the reproductive organs (the **aedeagus** in males, and **ovipositor** in females). The ventral portions of the abdominal segments are collectively termed **sternites** (or sometimes **sterna**) and the dorsal portions are termed **tergites**. The tergite of the 5th abdominal segment often extends beyond the elytral apices, especially in females, and is called the **pygidium**. The pygidium in females is sometimes modified with a ridge (called a **carina**) or pubescent swelling, which fits into a complementarily shaped concavity on the 5th sternite of the male (e.g., the genera *Trigonarthris*, *Typocerus*, and *Oberea*). In other species, the female pygidium and its sternite may be greatly elongated to form a tube (e.g., the genera *Acanthocinus*, *Eutrichillus*, and *Urographis*). The apex of the abdomen, therefore, may have species-specific external features useful in identification. Further, males commonly have a small portion of the 6th tergite visible beyond the pygidium, which can be extremely helpful in determining the sex of a specimen (see page 8).

Descriptive Terms

Features of the surface sculpture can be extremely important in identifying species (sculpture and other structural features are typically *much* more consistent than color), and sometimes the distinctions can be subtle, so the terminology needs to be precise. External modifications of the surface may vary considerably in form, including wrinkles (or **rugosities**), ridges, grooves (or **striations**), sutures, impressions, punctures, and various protuberances. It is useful to distinguish the following types of the latter, though they blend from one into the other: (1) **callus** (plural = **calli**) – a low, rounded swelling, sometimes elongated; (2) **tubercle** – a strong projection with a blunt, rounded apex; and (3) **spine** – a strong projection with an acute apex, often sharply pointed. Numerous terms are used for describing punctation, based on three features: (1) the diameter of each puncture – **fine** (small) vs. **coarse** (large); (2) the depth of each puncture – **shallow** vs. **deep**; (3) the spacing between punctures – **sparse** (or scattered) vs. **dense** (if punctures are absent, an area is termed **impunctate**). The surface in areas without punctures, or in between them, can also be characterized by its degree of roughness or how shiny it is; the gradation is from shiny or **polished**, to **dull**, and then to **opaque** (if visibly roughened like sandpaper, the term **granulate** may be used).

In addition to reflectivity, the surface may be covered to various degrees by pubescence, which may be characterized by (1) the length of the hairs; (2) the thickness of each hair – **fine** vs. **plumose**; (3) whether the hairs stand up from the surface or lie flat against it – **erect** vs. **appressed**; and (4) the spacing between hairs – **sparse** vs. **dense** (if hairs are absent, an area is termed **glabrous**). Pubescence can, of course, be worn off as a beetle ages, so not all specimens of a given species will appear the same. The shape of the body or a portion thereof is often described in terms of its length relative to its width, as being **elongate** (narrow) vs. **robust** (broad). Other terms may be used to describe the shapes of markings, edges, sutures, and other features: **arcuate** (arching), **sinuate** (twisting, usually S-shaped), **truncate** (squared-off, as opposed to rounded or pointed), or **emarginate** (with a concave margin). If a surface has fine ridges or grooves in a honeycombed type of pattern, it is often termed **reticulate**.

Thus, if you read a description such as “pronotum broad and anteriorly emarginate, with two polished, glabrous calli laterally; midline impressed, with dense, appressed hairs; the remainder of the surface dull, with fine, dense punctures and scattered long, erect hairs; elytra black with reddish humeri, longitudinally striate, granulate, with fine pale pubescence, and truncate apices,” you should be able to visualize the appearance, especially after comparing the description to an appropriate specimen. While it may sound intimidating at first, the terminology is easy enough to become familiar with, and the extra precision is very helpful.

HOW TO RECOGNIZE A CERAMBYCID

As with many things, there are exceptions to every rule, and it is difficult to specify a visible trait that is shared without exception by all Cerambycidae. The most distinctive and nearly universal feature shared by cerambycids is a very subtle one, almost useless diagnostically – the antennae arise from protuberances between the eyes (these protuberances are often associated with lobes that deeply divide the eyes). A second, and vastly more useful feature, is that all but two species of North American cerambycids *appear* to have four-segmented tarsi on all three pairs of legs (see under “Thorax,” p. 5). A third feature, less universal but quite practical when you are collecting live beetles, is the possession of a mesonotal stridulitrum (see p. 6). In essence, if you pick up a beetle and it squeaks or chirps, it is very likely to be a cerambycid. Finally, despite the common name, not all “longhorned beetles” have especially long antennae, though at least the first or third antennal segments are generally elongated relative to those of other beetles. Where antenna length is most useful diagnostically is on the smallest cerambycids (under 6 mm), whose tarsi may be very difficult to see and count accurately – virtually all of these small species have much longer antennae than any other beetles of comparable size.

Be alert for sexual differences in size and proportions (many features are **sexually dimorphic**), because I do not always illustrate both sexes. It is useful to learn how to tell apart the sexes of cerambycids, but this is also difficult in many species. Both males and females will sometimes evert their hidden abdominal segments when they die, but this happens rarely, and since the differences between a male aedeagus and a female ovipositor can be quite subtle, I do not suggest using internal genitalic features to distinguish the sexes. As a general rule, females are larger on average, more robust in form, and possess shorter antennae than males of the same species. Females are more likely to have the pygidium broadly exposed beyond the elytral apices, and males will often have a small portion of a tergite beyond the pygidium visible externally (see under "Abdomen," p. 6). Males of some species tend to have the final segment of the antennae distinctly longer than the next-to-last segment, and in other species the males have the compound eyes slightly enlarged relative to the female. Others have increased pubescence on the mandibles or fore tarsi.

Recognizing Non-cerambycids

Given the diversity of Cerambycidae, there are several families of beetles that contain at least a few members likely to be mistaken for cerambycids, especially **Cephaloidae** (false longhorned beetles), **Cantharidae** (soldier beetles), **Oedemeridae** (false blister beetles), **Rhipiphoridae** (wedge-shaped beetles), **Tenebrionidae** (darkling beetles), **Carabidae** (ground beetles), **Lucanidae** (stag beetles), **Meloidae** (blister beetles), **Lycidae** (net-winged beetles), **Melandryidae** (false darkling beetles), **Pyrochroidae** (fire-colored beetles), and even some **Staphylinidae** (rove beetles). However, all of these families (and virtually all the remaining non-cerambycid families) have five segments on the tarsi of the front and middle legs, and either four or five segments on the hind tarsi. Therefore, the first thing to check on a specimen is the tarsal segmentation, which is virtually foolproof. If one gets in the habit of checking this, it can save a lot of time trying to match up non-cerambycid specimens with the illustrations. Only two cerambycids in North America have five readily-seen tarsal segments on each leg (Parandrinae; our two Spondylidinae also have five visible segments, but the fourth requires a microscope to see). Once you can recognize these species, all other beetles with five-segmented tarsi on any leg can be instantly excluded. Conversely, there are cerambycids that resemble members of the above families, but again the tarsal segmentation readily separates them. Only a few beetle families appear to have four-segmented tarsi on all legs, and the only ones that can be readily confused with cerambycids are certain members of the **Chrysomelidae** (leaf beetles: esp. *Donacia* and *Lema*). Chrysomelids usually do not have the first or third antennal segments as elongated as those of cerambycids, nor have the antennae arising from a protuberance. Additionally, there are very few cerambycids that have the pronotum distinctly broadest *anteriorly*, though most of the cerambycid-like chrysomelids (and similar beetles from other families) have this trait. To assist, illustrations are provided on Plates 31 and 32 (pp. 114-117) for some of the species of northeastern beetles that might be most readily mistaken for cerambycids.

Immature Stages

The larvae of cerambycids are often found in wood, but can also be encountered in the stems or roots of herbaceous plants or grasses. The larvae can be separated with only a little difficulty from those of other beetle families by the following combination of features: they are fleshy, thin-skinned, and grublike, with or without small legs (usually without), with dorsal and ventral "pads" (**ampullae**) on the body segments that afford the larvae some traction, and sometimes small spines on the last abdominal segment. Usually the only clearly sclerotized part of the body is the head capsule, though often the prothorax (and the last abdominal segment, or both) is hardened or darkened to various degrees. The body is roughly cylindrical or slightly flattened, with fairly strong constrictions between segments, and the first few segments are only slightly thicker than the remainder (the larvae of buprestid beetles have a greatly flattened and expanded prothorax, often with a dorsal V-shaped groove). I do not include any information on genus or species-level identification of the immature stages of cerambycids, because these stages are poorly known. For some useful larval keys and photographs, see Craighead (1950), Baker (1972), and Solomon (1995).

Separating Cerambycid Species

All but one presently recognized species and one subspecies of northeastern Cerambycidae appear in the color plates in this guide. These photos, in combination with the diagnostic features discussed in the text (and often indicated by arrowheads on the plates), should be sufficient to allow confident species-level identification of all species, with very few exceptions. It is fortunate that there are only a small number of species that lack at least one simple diagnostic feature that makes identification unambiguous. Nearsighted people may be able to make many, if not most, identifications unassisted, even with many smaller species, but most people will need a reasonably powerful (at least 10X) hand lens, at least initially. Only a few species pairs may require the use of a microscope, though it is certainly generally helpful if one is available. By becoming familiar with the photos and synopses, readers with good memories for details may eventually be able to recognize over 200 different species on sight alone. For learning purposes, some readers may also benefit from visiting and examining specimens in nearby museums, but as a general rule, be aware that (a) most such institutions will require some advance notification of your intentions and reasons for a visit; (b) not all collections have been recently and reliably curated by experts in cerambycid identification (one can find misidentified specimens even in the most prestigious institutions); and (c) no single institution will have specimens of every species in this book. The photos here represent the combined resources of eight major museums and two private collections and the examination of over 50,000 specimens collected over the last 150 years to find those in best condition and most representative of different forms and sexes.

HOW TO READ SPECIES SYNOPSES

Let us examine one of the first species listed, as an example:

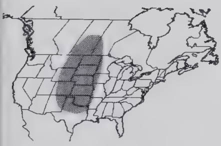
Parandra b. brunnea (Fabricius) [Fig. 1a-b]
Flight Period: March-November, ENA
Larval Feeding Habits: moist, decaying heartwood of nearly all eastern trees. **Size**: 8-20 mm. **Notes**: occasionally in cavities of living trees, very damaging to structural wood in soil contact, earning it the common name "Pole Borer." Very unusual appearance for a cerambycid; fairly variable in size and darkness, esp. males. Eyes emarginate. Adults attracted to UV lights.

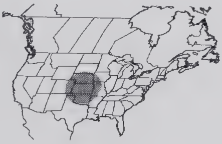
First of all, species not native to North America are preceded by an asterisk (*), and those not definitively recorded from the Northeast but that are likely to be found within the area are preceded by a question mark; this species has no such special notations, so it is native and has been collected in the Northeast. Second, the species epithet "*b. brunnea*" indicates that this is the species *brunnea*, subspecies *brunnea* – the abbreviation is standard shorthand for what is called the "nominate subspecies" (the subspecies that matches the species name, which would be redundant if spelled out). In this case, there is also a subspecies *brunnea coloradensis*, known from Colorado, and thus not included in this guide. Generally, subspecies designations are used to denote forms that are both geographically and morphologically distinct, but presumed to be capable of interbreeding. If it was discovered that the above two subspecies could not interbreed, for example, they would probably be elevated to species level, the first as *P. brunnea*, the second as *P. coloradensis*.

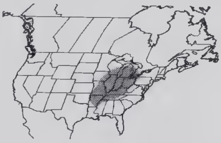
The name following the species epithet refers to the author who originally published the description of the species. In this case, the author was Fabricius, one of the most prolific of all the early taxonomists (which is why his name is usually simply abbreviated as "F.") who described the species in 1798 as "*Tenebrio brunneus*," believing it to belong to the family Tenebrionidae. This placement was later corrected (in 1817, by Schönherr), and this is why "Fabricius" is placed in parentheses; this is the convention for indicating that the original description placed the species in a different genus than it now occupies. For example, the complete designation for the Colorado subspecies is *P. brunnea coloradensis* Linsley, and the lack of parentheses indicates that Linsley placed this subspecies in *Parandra* when he first described it. For several species in this guide, the latest revision of the name is fairly recent, and the older names, which were sometimes in use for decades, are included under the corresponding present names in the Taxonomic Index (p. 153) for those readers familiar with the older nomenclature. This is especially prevalent in the Lamiinae, for which the latest major revision was 1995.

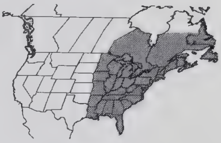
The data under "**Flight Period**" are typically the earliest and latest collection dates (not counting specimens emerging indoors) in the published records or on specimens examined by the author, followed by notation indicating the general geographic distribution of the species (in this example, ENA indicates eastern North America; see figure below). Note that the peak of flight activity is not indicated; it is rarely known, and will vary throughout the Northeast and even from season to season, so the dates given here are only a general range. As discussed in the foreword, the geographic distributions are *intentionally* generalized here. This was a difficult decision, but it is an appropriate way to present the data. Far too little is known about the majority of species in this guide for a more detailed presentation to be considered trustworthy. The actual distributions of most species are probably considerably more extensive than present collection records indicate, and there are many areas that are poorly sampled, at least as is evident in the literature (e.g., Kentucky and much of northeastern Canada). Therefore, a state-by-state listing or a map of actual collecting sites might ultimately be more misleading than informative by greatly underestimating the ranges of many species.

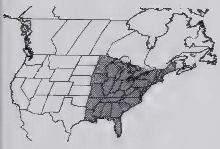
With three exceptions (NA, NNA, SNA), notations indicate only the distribution east of the Rockies, even for primarily western species (e.g., *Spondylis upiformis*). The following illustrations demonstrate the general distribution patterns that are recognized here, and the abbreviations should be self-explanatory:

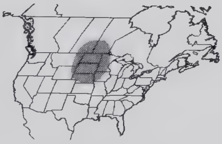

CNA

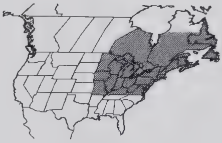

CUS

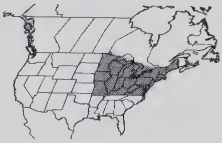

ECUS

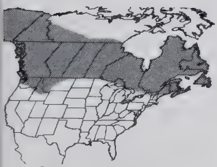

ENA

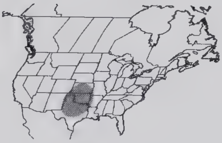

EUS

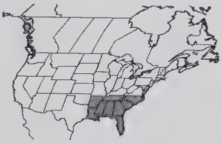

NCNA

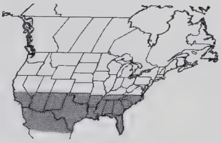

NENA


NEUS


NNA


SCUS


SEUS


SNA

Two additional common distribution patterns are "Great Lakes area," which means the area within roughly 100 miles of the Great Lakes, and "Atlantic Coast," which means the area within roughly 200 miles of the Atlantic coast.

Data under "**Larval Feeding Habits**" are also generalized somewhat, as in the example given, because we know too little about the *exact* range of hosts a given species may feed upon. Presenting host data as if it were a complete list would, as before, be potentially more misleading than informative. If there is an obvious tendency or restriction in host associations, this is indicated, but the more hosts a species feeds on (and the more different these hosts become from one another), the less utility there is to listing hosts species by species, especially for a guide such as this. I refer readers who are interested in detailed host lists to the original literature. Note, however, that older literature is increasingly likely to attribute host records to species that have since been renamed or subdivided. When hosts are unconfirmed, the entry is in brackets, as in [pine?], for example.

The numbers given under "**Size**" indicate the known minimum and maximum lengths of the species, measured from the front of the head to the tip of the abdomen. In general, females are towards the upper end of the size range for a given species. However, the complete size distribution for a species is commonly skewed so there are more individuals closer to the lower end of the range, and truly large individuals are rare. Of course, there are other species demonstrating the opposite pattern, and others where the distribution is evenly balanced, perhaps even a normal distribution (a "bell curve"). I know of no published studies of size distributions in northeastern cerambycids, however.

The "**Notes**" section is for discussion of physical appearance of the species, especially diagnostic features, intraspecific variation, and comparison to similar species (if any), plus any additional details on habits, distribution, abundance, and so on. The information here should allow for reliable separation between even the most similar sets of species, when used in conjunction with the figures, as well as recognition of many rather uncommon color variants. Also, rather than create hundreds of new "common names" for species, I have opted to limit the use of such names to those species for which well-established common names exist, and present them only in the "**Notes**" section and plate captions. I do not encourage readers to learn or promote the use of common names, as they vary too much among (and often *within*) cultures. Scientific names may be more difficult to pronounce, but they are unambiguous and universally recognizable. For readers interested in rules of pronunciation, I recommend any of the editions of Borror et al.'s classic *An Introduction to the Study of Insects.*

CHAPTER 2: Ecology and Natural History

A number of publications produced within the last half century discuss the biology and ecology of Cerambycidae in detail, most notably those of Craighead (1950), Linsley (1961a), Baker (1972; largely recapitulates Craighead), Drooz (1985; largely recapitulates Baker), and Solomon (1995). Each of these has an extensive bibliography, though they tend to focus somewhat on species of economic importance. Rather than trying to duplicate their efforts, I will only briefly touch upon the more general aspects of cerambycid ecology here; readers interested in a more detailed treatment are strongly advised to seek out the above references and their bibliographies.

A species-by-species account of life history and ecology would be very uneven because so few of the northeastern species are well-known biologically (life cycles of some 100 northeastern species are documented). For example, the most recent review, Solomon (1995), gives details of the biology of just over 50 northeastern species found in woody plants, representing the majority of species that have been studied in detail: *Parandra brunnea, Archodontes melanopus, Stenodontes dasytomus, Prionus imbricornis, P. laticollis, Desmocerus palliatus, Strophiona nitens, Tylonotus bimaculatus, Aneflomorpha subpubescens, Anelaphus parallelus, A. villosus, Enaphalodes cortiphagus, E. rufulus, Parelaphidion incertum, Psyrassa unicolor, Dryobius sexnotatus, Physocnemum brevilineum, Glycobius speciosus, Megacyllene robiniae, Neoclytus acuminatus, Xylotrechus aceris, X. quadrimaculatus, Purpuricenus axillaris, Goes debilis, G. pulcher, G. pulverulentus, G. tesselatus, G. tigrinus, Plectrodera scalator, Dorcaschema alternatum, D. wildii, Oncideres cingulata, Aegomorphus morrisii* [as *morrisi*], *Saperda calcarata, S. candida, S. cretata, S. discoidea, S. fayi, S. inornata, S. lateralis, S. obliqua, S. populnea moesta, S. puncticollis, S. tridentata, S. vestita, Oberea delongi, O. gracilis, O. ocellata, O. perspicillata* [as *bimaculata*], *O. praelonga* [as *tripunctata*], *O. pruinosa* [as *schaumii*], *O. ruficollis, O. schaumii,* and *O. tripunctata*. With the addition of records in Baker (1972), this list can be extended to include *Orthosoma brunneum, Rhagium inquisitor, Tetropium cinnamopterum, Atimia confusa, Smodicum cucujiforme, Oeme rigida, Knulliana cincta, Eburia quadrigeminata, Elaphidion mucronatum, Callidium antennatum, Hylotrupes bajulus, Phymatodes testaceus, Semanotus ligneus, Megacyllene caryae, Neoclytus caprea, Xylotrechus colonus, X. sagittatus, Monochamus scutellatus, M. titillator, Acanthocinus nodosus,* and *Oberea myops*. A few of the species in genera that feed on herbaceous plants, such as *Crossidius*, *Dectes*, and *Tetraopes*, have also been studied in some detail, and a few species have been studied extensively on an individual basis, such as *Monochamus carolinensis*. References for many such studies are given in the bibliography, or the bibliographies of the above references. For most of the remaining species in this guide, the host records and phenological data presented are almost all that is known.

GEOGRAPHY, CLIMATE, AND HABITAT

Many of the geographic and habitat association patterns seen in the distributions of beetle species can be traced to host associations, but it is not actually very common to find a beetle that occurs everywhere its potential hosts grow. Other factors, such as climate, frequency of fires or floods, potential competitors, predators and parasites, availability of flowers for adult feeding, even soil quality, can play a role in determining whether a given beetle can survive succesfully in a given area. Relatively little is known about the importance of such features in determining the limits of species' distributions, but certainly one of the benefits of this guide will be to help assemble a greater knowledge of what those limits may be for various species (by generating many new geographic records complete with habitat notes). For some species, clear delineation of the distributional limits and habitat associations may indicate that a species is threatened and in need of protection (some species listed here may already be extinct, as well). Perhaps greater insight can be gained when these limits are compared to other environmental features. It is clear, though, that different forest types (e.g., coniferous, oak-hickory, beech-maple, etc.) support different characteristic assemblages of beetles, and that these assemblages will vary over different regions, presumably also reflecting the state of forest maturity or health (seen, for example, in the proportions of species that feed on living trees versus wounded trees versus decaying logs, etc.). Certain distribution patterns become evident as one examines the correspondence of vegetation and certain beetle taxa. Conifer-feeding species found in the East in the Great Lakes area are also commonly much more widely distributed in the West, while a number of species almost exclusively restricted to the humid Southeast can be found along the coast into Virginia and Maryland or the Mississippi River drainage, and another set of species found largely in the prairies of the central plains may occasionally occur in Missouri, Illinois, Iowa, or Minnesota. Global affiliations of northeastern species and genera have been discussed by Linsley (1961a), who suggests that some are of holarctic affinities, a few of neotropical affinities, and a few have their center of diversity in northeastern North America itself. However, many are associated with European or Asian groups (especially Japan), including some that are quite diverse here (e.g., *Saperda*, *Oberea*, and *Typocerus*).

HOST PLANTS, LIFE HISTORY, AND PHENOLOGY

Given the diversity within the Cerambycidae, it is not surprising to find a wide variety of life histories and larval host associations. Many species are extremely limited in their host associations, and others seem capable of feeding on a broad diversity of conifers or hardwoods (though it is interesting that even among generalists, few species feed on both conifers *and* hardwoods). In many cases, specificity is demonstrated not in choice of host species but in structural affinities, to the point of attacking only branches or roots of certain diameters, bark of certain thickness, having preferences for certain heights, and especially important are restrictions to wood in certain stages of decay. These latter forms of specificity can allow for a wide variety of species to coexist and share a single host species in a single area without necessarily competing with one another for resources (though such competition certainly occurs in many cases). As a general rule, the most restricted host ranges are exhibited by species attacking living hosts, while species feeding on wood in later stages of decay tend to be more generalized. Much of this is discussed in detail by Linsley (1961a). Little is known about how well and by what means cerambycids digest wood. Some species possess cellulase, and are thus truly able to digest the wood, while others are presumed to derive their nutrition from cell contents, and not the cellulose cell walls. Yeastlike intracellular symbionts are known from the guts of some species, and these may play an important role in digestion, suggested by the fact that these symbionts are actively smeared onto the eggs when they are laid, and ingested by the emerging larvae as they consume the eggshell.

Eggs are commonly laid in cuts or crevices in bark, sometimes in wounds made by the adult beetle. While the egg stage is typically brief (2 weeks or so), larval development commonly takes 1 to 3 years. In some Prioninae and certain other species in other subfamilies, however, larval development may sometimes last decades. Patterns of larval feeding vary as well. Most commonly, the larvae feed beneath the bark for most of their life, and when ready to pupate they bore into the heartwood and excavate a pupal chamber there (a few pupate in the bark itself). Other species will spend the entire larval period in the heartwood, or form galls within stems or branches. In some species, the larva girdles the branches (rather than the adult, as in *Oncideres*) from within, cutting off the flow of nutrients. Root-feeding species may spend some portion of their development feeding externally on the root underground, or moving through the soil. Such species will often pupate in the soil, as well. Most others pupate within the plant, commonly chewing an area through nearly to the surface before pupating, so the adult has only a thin layer to penetrate upon emergence. Where a pupal cell is constructed, it may have a protective lining, and the eventual emergence hole is often plugged with wood fibers or frass. The pupal stage itself tends to be relatively short, from a week to a month, though the adult may wait in diapause several months before emerging.

Adult emergence for any given population tends to be well-synchronized, usually occurring over a temporal “window” extending from a week to a month, though some species may have more prolonged emergence periods. However, the timing is clearly weather-related, and thus shows considerable variation from year to year and region to region. It is also true that more southern populations routinely emerge sooner than their northern counterparts in the same species. The peak emergence of the majority of northeastern species is in June and July, though at the southern extremes it shifts to an earlier average date. While adults do not appear to live for very long after emerging – a month or two at most – many species appear to require adult nourishment, at least for the females, which can produce hundreds of physiologically costly eggs. While pollen and nectar feeding are quite common, various species may feed on leaves, fruit, sap, bark, cones, and fungi, and members of the genus *Elytroleptus* may be predatory.

REPRODUCTION

Some cerambycids will mate upon the host plants when they emerge, rather than dispersing and then having to locate members of the opposite sex. However, in general, males are at least temporally (they typically emerge earlier) and usually spatially separated from females, requiring some sort of search or attraction. Many of the flower-feeding species rendezvous at floral hosts, and mating occurs there. In insects where attraction of males to female pheromones is known to occur, the male antennae are often elaborately branched so as to possess greater surface area. Such modification is seen in the Cerambycidae only in the Prioninae. Nonetheless, there is evidence for dispersal and long-distance attraction in other cerambycids with unmodified antennae. It appears that various species make use of the chemicals produced by the host plants themselves to bring the sexes together, especially in hosts containing aromatic and volatile compounds (such as conifers). This phenomenon is quite evident in species that attack freshly cut or wounded hosts. In such cases, both sexes are attracted to the host plants by the same compounds, and when they encounter one another, courtship and mating may follow. Some evidence suggests that the longer antennae of males may help them locate females by touch as they patrol the host plant. Also, experimental evidence demonstrates that physical contact of a female by sensors in the antennae is sometimes necessary for a male to even *recognize* a female. When males encounter other males, violent combat may occur (especially true in Prioninae and Cerambycinae), and they will often grapple and attempt to sever their opponent's legs or antennae. This is one explanation that has been suggested for why the basal antennal segments of many cerambycids are so greatly thickened and toughened (there is likewise a suggestion that spiny, sturdy antennae may help a beetle extricate itself from within a log; the two ideas are not mutually exclusive). Males of some Lamiinae are known to exhibit a less violent combat, with males pushing each other and butting heads until one yields. Males and females will sometimes engage in fighting prior to mating, though the purpose of such combat is unclear. The microscopic ridges on the surface of the stridulitrum may yield sounds or substrate-borne vibrations of a characteristic frequency, and the pattern of "squeaks" (stridulation) may also differ between species, much like bird songs. Such stridulation by adults might be involved in courtship, serve as a mode of species recognition, or assist in locating members of the opposite sex. However, courtship behaviors on the whole have been studied little and would not appear to be elaborate, though the act of copulation may take many hours. Mating tends to be briefest on those hosts where the stage attacked is more ephemeral, such as fresh tree wounds.

PREDATORS, PARASITES, AND OTHER ASSOCIATIONS

Linsley (1961a) gives an extensive list of parasites and predators of cerambycids; the former list includes nematodes, fungi, sarcophagid and tachinid flies, and a great many wasps including braconids, ichneumonids, eurytomids, eulophids, eupelmids, pteromalids, encyrtids, gasteruptiids, and bethylids. The predators include clerid, colydiid, cucujid, elaterid, and ostomid beetles; asilid, xylophagid, and rhagionid flies; phymatid and reduviid bugs; carpenter ants; spiders; scorpions; trout; toads; lizards; woodpeckers; flycatchers; nighthawks; shrews; bats; mice; skunks; and several other vertebrates. Among these, the predominant parasites appear to be the braconid wasps, which drill through bark or stems to lay their eggs inside the larvae, while the most important predators appear to be clerid beetles and woodpeckers, also attacking larvae in their burrows. There is, conversely, evidence that some cerambycids are themselves threats to other wood-feeding insects, most notably certain bark beetles (Scolytidae).

One of the more unusual associations is that of some nematode species, such as the pinewood nematode, which use the adult beetles (*Monochamus carolinensis*, in this case) as vectors. When the beetle inserts its eggs beneath the bark, the nematodes leave through the ovipositor and infect the wood. Other intriguing associations are those of certain mites and pseudoscorpions that can be found riding on the bodies of adult longhorns, especially the larger species, such as *Monochamus* species or *Stenodontes dasytomus* (the pseudoscorpions often ride beneath the elytra, so they cannot be detected unless the elytra are lifted). Given the tolerance the beetles seem to exhibit for these tiny hitchhikers, it seems likely that these organisms are simply using the beetles as convenient dispersal agents to get from one rotting log to another, rather than actually parasitizing the beetles. This is clearly true for many of the pseudoscorpions, which are predatory rather than parasitic. It is even possible for the relationship to be beneficial to the beetles, if, for instance, it were found that the mites fed on fungi that might otherwise grow in the larval burrows, or that the pseudoscorpions killed organisms that fed on the beetle eggs or larvae.

Of special ecological importance is the common occurrence of one of two forms of deceptive adult coloration in cerambycids, **crypsis** (camouflage) or **mimicry**, both of which clearly have evolved in response to predation. The former phenomenon is easily seen by the large number of species, especially in the Lamiinae, whose markings and surface sculpture are irregular and colored similar to tree bark and other natural substrates on which the beetles might be found. Many of the uniformly dark brown or black species are nocturnal and hide during the day, so they are rarely seen and don't require protective coloration. Species active during the day are often brightly colored, especially those encountered on flowers. Many of these species resemble bees and wasps of various types in coloration and even behavior (such as buzzing in flight, or rapid antennal vibrations). Other species resemble ants, which are common and chemically-protected; many predators have learned not to eat ants and are therefore biased to avoid the beetles. As one progresses farther south in North America, there is a trend for red ant species to become more common than black ant species, and most of the ant-mimicking cerambycids have black forms in the North and red forms (often considered subspecies, but this is debatable in many cases) in the South, accordingly. Several species of cerambycids are boldly marked orange and black, some of which are mimics of extremely distasteful lycid beetles. If these species are themselves edible, they are called Batesian mimics (where the mimicry serves to deceive potential predators), but if they are also distasteful, then they are called Müllerian mimics (where several species gain mutual benefit from the resemblance, because the predators learn to avoid them simultaneously instead of separately). Other orange-and-black species are definitely chemically-protected themselves, rather than mimics, and this is called **aposematism** (warning coloration; e.g., *Tetraopes* species).

INTRASPECIFIC VARIATION

What constitutes a species? Most traditional definitions have reproductive isolation as a central theme – that is, if two populations cannot interbreed (or do not when they co-occur), they should be considered separate species. "Subspecies" are traditionally utilized when two distinct and closely related forms occupy non-overlapping geographic ranges, so the opportunity for interbreeding is absent but still believed to be a potential occurrence. Obviously, these are rather difficult criteria to test in nature (and often quite subjective), and this has prompted some revisionary thinking in species concepts in attempts to derive a more practical, objective definition. One such definition is that a species is the smallest group of populations that are recognizable by a unique combination of features shared by all comparable individuals. If this definition gains acceptance, it will almost certainly result in the species and subspecies discussed in this field guide becoming more finely divided in many cases, more grouped in a few others. Certain species and subspecies in this guide are of an accordingly dubious nature. For example, the subspecies of *Typocerus lunulatus* (and perhaps also of *Molorchus bimaculatus* or some ant-mimetic species) do not appear to deserve this ranking since some populations appear to contain a mix of forms, and perhaps they are best considered color variants of one species. Criteria of physical (or genetic) distinctiveness are easier to judge than potential interbreeding, but can still require the examination of many specimens and detailed geographical study to evaluate whether different forms do or do not intergrade. As a general rule, coloration tends to be far more variable than structural features (excluding size; often body proportions change with size, especially male mandibles, legs, and antennae, a phenomenon called **allometry**), and among structural features the most significant clues to species status have traditionally been those associated with reproduction (variation in such structures could be quite problematic for individuals of atypical form). I have done my best to advise the readers of the variation present in the various species in this guide, so even the most uncommon variants should be possible to recognize. Bear in mind the figures are only examples, and that many intermediates may exist between extremes illustrated. My purpose here is also to remind readers that what are presently recognized as variants may someday be considered species, and vice versa (I have also noted cases where such changes seem especially likely), not only because of changes in our knowledge of the beetles, but also sometimes simply because of a change in how people define species. Classification systems are not written in stone, because they reflect our current state of knowledge, which is always imperfect and subject to revision and improvement.

CHAPTER 3: Collecting and Preserving Specimens

COLLECTING TECHNIQUES AND EQUIPMENT

One of the advantages of working with cerambycids is that there is a variety of methods one can use to collect specimens, each of which has its own strengths. Many different types of equipment and other adjuncts can be used to help collect, study, and identify cerambycids, and even a general sense of "where" and "when" can be extremely helpful. Numerous other insect-related field guides give details on the specific designs and construction of many of the pieces of equipment described here. An especially thorough discussion of both collection and preservation techniques is given in White's *A Field Guide to the Beetles of North America*, which is a perfect complement to this guide. In light of the numerous other references, such as White's, that deal in great detail with collection and preservation, I will focus on the essentials and those aspects that have *not* been discussed in other references.

Familiarity with vegetation in an area can be an extremely valuable asset, and a field guide to trees and shrubs is one of the best adjuncts you can possess. Among the benefits to knowing the vegetation well are three that are particularly special: (1) if one is seeking a particular beetle species, one can target the host plants and greatly improve the odds of success; (2) in many cases, the identity of a beetle's host plant can be a very important clue to the *beetle's* identity; and (3) there are several northeastern cerambycids whose host plants are presently unknown, and there is a great potential for readers of this guide to make genuine contributions to our knowledge of cerambycid biology if they are capable of identifying host plants (though it can admittedly be difficult to identify leafless fallen trees or branches).

In addition to a knowledge of tree and shrub species, it helps to have an eye for the kinds of flowers to which many cerambycids, especially Lepturinae, are attracted and can be found in large numbers. Often plants that have large clusters of small white flowers (such as hydrangea, viburnum, elderberry, dogwood, plum, *Ceanothus*, or *Pycnanthemum*) are the best for lepturines, though virtually any flowers where the pollen is open and accessible, such as composites (daisylike flowers, including goldenrod, black-eyed Susan, etc.), may be visited by pollen- and nectar-feeding cerambycids. It is much less common to see beetles on plants with well-separated individual flowers or tubular blossoms, and beetles are generally much more likely to be found on flowers when it is sunny and warm. For woodland species, sunny patches within woods, or flowers along the outer fringes are good places to focus on, while species that feed on herbaceous hosts, such as milkweed, will usually be found on their host plants. A great many species are best collected at night around lights, and others can be found by gathering fallen branches and twigs and rearing larvae to adulthood (page 21). Tearing apart fallen logs is occasionally profitable, but the technique is disruptive and destructive and therefore emphatically not recommended.

The most utilitarian piece of collecting equipment one can have is a sturdy **aerial net** with a reinforced rim or a **sweep net**. A net can be used to sweep beetles off of vegetation, including flowers or low grass, or even held beneath vegetation to catch falling beetles if a beating sheet is unavailable. A **beating sheet** is a large piece of sturdy cloth that can be held beneath a mass of vegetation, especially when it is dense and shrubby, while the collector beats the vegetation with a stick. Beetles commonly respond to disturbance by simply dropping (rather than flying away), and a beating sheet – or even an umbrella – represents a larger surface onto which beetles can fall, relative to a net. Some of the more lively species, such as those in the Clytini, may have to be grabbed quickly before they recover and fly off; a number of these resemble bees or wasps, and a moment's hesitation by an overly cautious predator (or collector) is all they need to escape. Note that no cerambycids are venomous, though a few of the larger species can inflict painful bites or have sharp spines. As long as one is careful, one can handle all species safely without requiring the use of gloves or forceps.

When collecting live, active beetles using these techniques, it is often desirable to kill and keep specimens for later reference. Several alternative methods can be used: (1) placing beetles in **killing jars**, typically containing toxic chemicals that act fairly quickly, such as cyanide crystals or drops of ethyl acetate, though most such chemicals are also toxic to humans, and should be used with extreme caution; (2) placing containers with live beetles into a **freezer** for several hours; and (3) placing live beetles directly into **ethyl alcohol**, typically 70-75% dilution. The latter two techniques have the advantages of nontoxicity and a more reliable killing. Beetles with slow metabolism can be somewhat resistant to gaseous poisons and remain alive long after they become immobile, in which case if they are removed and pinned too soon, they can "come back alive" hours later. If larvae are being collected, it is helpful to drop them into boiling water (removed from direct heat) for 1 minute, and then place them into ethyl alcohol. They will preserve better if treated this way, though some specialized entomological preservative solutions are even better.

A few largely passive collection methods also work well for cerambycids:

(1) **Ultraviolet lights** ("black lights"), used in conjunction with a large white sheet at night, can attract a great many nocturnal cerambycids that are rarely encountered otherwise, and can be an extremely productive technique. Such lights are easy to obtain through biological suppliers, though they work best in areas where they can be seen from a long distance, and with no other lights around, so a small portable power source is frequently necessary. Some models plug into the cigarette lighters of cars to get around this problem. If one is only interested in collecting cerambycids, it is *far* preferrable to simply wait by the light and capture incoming beetles by hand, using a headlamp or flashlight. Thousands of various insects of hundreds of species may be attracted to a single light in a single evening, and setting up a UV light as an unattended light trap (with a capture device attached) will needlessly kill thousands of insects, many of which may be rare or beneficial. If one finds it necessary to use such a technique, it is best if some arrangements can be made in advance to donate non-cerambycids collected to someone who can use the material, such as a museum or biomonitoring program. It is of course true that virtually any bright lights will attract cerambycids, and some people have

amassed large collections solely by familiarizing themselves with their home town's street and business lights, and discovering which of these attract the most insects (often based on proximity to woods, and degree of isolation from other bright light sources).

(2) **Rearing traps** can be constructed from large jars or containers into which severed twigs or branches are placed and left indefinitely, and checked occasionally to see if any beetles (or other insects) have emerged. A design using an opaque container with a small "window" to which emerging insects will be attracted (into an attached transparent container) is especially efficient. Be sure there is some allowance for ventilation, though openings in the screening should not exceed 1 mm or so; fine screen mesh or durable cloth are best (if the cloth is too fine, many beetles are strong enough to chew through it to escape). The wood should ideally be periodically moistened to keep the larvae from dessicating. Such traps are generally best left unheated during the winter because a long period of cold is sometimes *necessary* to complete development. Rearing beetles from twigs of known plant species can be extremely informative for acquiring host plant data. Rearing also commonly includes the emergence of various parasites of the beetles; generally little is known about parasites of cerambycids, and such data can be potentially valuable if the cerambycid host happens to be a pest species.

(3) A few cerambycids, especially in the tribe Trachyderini, will be attracted to rotting **fruit or molasses traps** hung from tree branches. Other than this, there are apparently few baits that will attract cerambycids, though some of the species that attack evergreens or other resinous or aromatic woods will often come to freshly cut wood or tree wounds; **pine oils or turpentine** have occasionally been used succesfully to attract such species.

CARE OF SPECIMENS

Unless one is attempting to preserve larvae, alcohol should be viewed as a temporary storage measure only, and specimens should ultimately be pinned on **insect pins** (either pinned directly or "pointed"; below) and appropriately labeled. Insect pins can be obtained from various biological suppliers, and come in a variety of diameters. For cerambycids, the smallest diameter pins one should use would be size # 0 or 1 for the smaller species, # 2 or 3 for the majority, and maybe as large as # 4 or 5 for the largest species. Especially small (e.g., less than 6 or 7 mm) or slender specimens should be "**pointed**," a technique of gluing (using either white glue, which is water-soluble, or nail polish) the right metapleural region to the downturned tip of a small triangle of stiff paper (such as index card; about 7-8 mm long and 2 mm wide at the base) which has itself had a # 2 or 3 pin inserted through its base. A **mounting block** can help align specimens and labels at proper heights on the pins, but with some practice this can be done largely by eye. The specimen or point should be placed roughly 10 mm below the head of the pin, as this is sufficient space above the specimen to grasp the pin without touching (and potentially damaging) the specimen. The date/locality label should be just slightly below the center of the pin.

It is best to use acid-free (archival quality) paper for labels, and either use fine, permanent ink or have labels printed on such paper stock. With the advent of laser-writers, it is now much easier for collectors to print their own date/locality labels with letters only 3 points high. However, such labels are prone to dissolution if placed in alcohol, and it is simplest to use India ink and other alcohol-resistant inks if one intends to keep specimens in alcohol. Labels should have no less information than the following, in this order: the name or abbreviation of the **state/province** (capitalized), followed by the **county** name, **distance to the nearest town**, **date**, and name of **collector**. For further refinements, in areas of high topographic relief, **elevation** measures are very helpful, and **latitude/longitude** coordinates are also extremely useful if known. If a **host plant** is known, it should be listed last, and the scientific name of the plant should be given if known, rather than the "common name." For reared specimens it may be best to have two labels: one for the site and date the wood was collected, and another for the date of adult emergence, marked appropriately so there is no confusion. Labels with the identity of the species should be prepared separately and always placed at the very bottom of the pin; information should include **genus**, **species** (and subspecies, if any), abbreviation of **author** name, **date** of determination, and name of **identifier**.

Insect collections must be protected from being eaten by other insects, especially carpet beetles (Dermestidae), roaches, and booklice. Dermestids are the most difficult to avoid, and even major world museums have problems keeping them from destroying valuable specimens. Unfortunately, most repellents or toxins adequate for the task are also somewhat toxic to humans; the most commonly used are paradichlorobenzene (PDB) and napthalene. The latter tends to last longer, but both are merely repellents and will not kill dermestids that have already entered one's collection (mixing the two chemicals will not help, and chemical reactions between the two are potentially dangerous). However, a habit of constant vigilance is by far the best way to maintain an insect collection – one need never lose any specimens to pests. There is no substitute for an airtight, museum-quality drawer or Schmitt box, and **regular examination** of one's collection. The fine, powder-like "frass" produced by dermestid larvae should be looked for *every* time one handles the material (look on the labels beneath specimens, especially), and if any is found, everything in the drawer should be frozen for 24 hours, allowed to warm up again for a day, and frozen again (to allow any eggs to hatch; young larvae cannot tolerate freezing as well as eggs). The ideal lining for a drawer or box is soft polethylene foam, but not styrofoam (polystyrene), which "melts" in contact with PDB. Cork bottoms or balsa wood are less than ideal but passable. Care should also be taken to minimize exposure to direct sunlight because specimens will "bleach" over time.

With care, though, it is possible to keep insect specimens intact for centuries. More than half of the beetles photographed for this guide are specimens collected in the late 1800s, and for most of these, the only clue to their age (other than the labels) is the deterioration of the *pins*, rather than the specimens themselves! It is for this reason that investment in top-quality, durable pins, labels, and containers is always worthwhile.

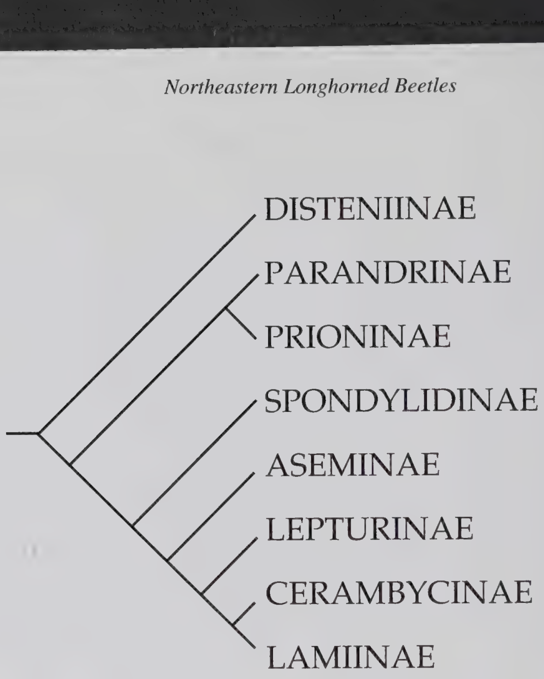
CHAPTER 4: Classification

THE COLEOPTERA

The order Coleoptera, the beetles, is one of the largest of all animal orders, comprising some 300,000 of the roughly 1,000,000 known species of *all* organisms, including plants and fungi, on the planet. The closest group to the Coleoptera is the Neuroptera (lacewings and their relatives), and these two orders together comprise the Neuropteroidea, a superorder within the Insecta. The Coleoptera are grouped into 4 suborders, one of which (the Polyphaga) is divided into 16 superfamilies (with 150 included families) containing the vast majority of beetle species. One of these superfamilies, the Chrysomeloidea, contains four families: Cerambycidae, Chrysomelidae (leaf beetles; includes Bruchinae), Megalopodidae, and Orsodacnidae. Some 20,000 cerambycid species exist worldwide, at least twice as many chrysomelids, and the remaining two families are very small and have until recently been included within the Chrysomelidae. The Curculionoidea (weevils, bark beetles, and their relatives), another very diverse group, are the nearest relatives of the chrysomeloids.

HISTORY OF TAXONOMY

The formal taxonomy of Cerambycidae dates back to Linnaeus' *Systema Naturae* in 1758, in which he described and named 76 species. This work was soon added to by other famous taxonomists such as Geoffroy, Drury, DeGeer, Olivier, and Fabricius. By 1801 there were 593 known species. The family itself was not separated from the other Coleoptera until 1815, and shortly thereafter others began to subdivide the family into subfamilies, with a fair bit of the presently recognized hierarchy established by the 1870s (at which point there were nearly 8,000 known species) by authors that included Thomson, Lacordaire, and especially LeConte. The most significant historical studies of the North American cerambycid fauna as a whole were those of Haldeman, Leng, and Hamilton in the mid- to late 1800s, followed by the recently completed monograph of Linsley and Chemsak, which required over 30 years to finish. Numerous more regionally oriented studies exist, including Downie and Arnett (1996). The total number of cerambycid species known from North America including Mexico is now approximately 1,500. The most recent understanding of the relationships of the cerambycid subfamilies of the world is based on the work of Svàcha and Danilevsky (1987), Monné and Giesbert (1994), Napp (1994), and most recently Lawrence and Newton (1995), who recognize 13 subfamilies. The systematic hierarchy in this guide relies primarily on Napp (1994), who has performed the most thorough phylogenetic analysis; Napp's hypothesized phylogeny (for the subfamilies in this guide) is presented on the following page.



IDENTIFICATION

The 600+ images on the plates have been arranged so that, in general, the species most similar in appearance occur together to facilitate comparison and yield a correct identification with a minimum of effort. One's ability to match images by eye and *then* focus on small details is vastly superior to the alternative (in this case, working through a detailed 200-couplet dichotomous key). Generally, then, the species diagnoses in the following chapter are very brief for the most distinctive species, and go into greater detail as the possibility of confusion between species increases. These diagnostics are often simplified for the captions alongside the plates, and I recommend that readers always refer to the species synopses when making an identification. Numerous extra photographs and/or descriptive details are included to accommodate for variation within species, including most cases of pronounced sexual dimorphism (sex of specimen is indicated where useful), but many species have variant forms in between extremes illustrated, or of which I was unable to obtain specimens. Bars immediately to the left of illustrations indicate the exact length of that particular specimen, from head to tip of abdomen (excluding jaws, antennae, and genitalia). Where no bar is given, the illustration is at same scale as the preceding illustration (from left to right); some species were photographed as male/female pairs, for example, to give a better indication of relative sizes of sexes. Arrowheads point to specific diagnostic features mentioned in the text. If you have a beetle that does not match any of the illustrations, check the tarsal segmentation to make sure it is a cerambycid (see p. 8, "Recognizing Non-cerambycids"). Supplementary illustrations on the last two plates demonstrate some examples of non-cerambycids that might be confusing, but these species are not discussed in the text.

CHAPTER 5: Species Synopses

Family **CERAMBYCIDAE**

Subfamily **DISTENIINAE**

General notes: Several unusual features, especially those of the larvae, indicate that this is a natural group (with only one distinctive representative in the Northeast) and place it either as the nearest-related family to Cerambycidae, deserving of independent recognition, or as a primitive group within the Cerambycidae (the most recent classification). Most resembling Lepturinae (below) in the structure of the head and pronotum. Undivided mesonotal stridulitrum, head projecting forward.

Tribe **Disteniini**

Distenia undata (Fabricius) [Fig. 40]

Flight Period: June-September, EUS

Larval Feeding Habits: various hardwoods, incl. redbud (also pine). **Size**: 16-25 mm. **Notes**: The clusters of long hairs on underside of antennae, strong pronotal calli and lateral projections, distinctive body shape and pattern of markings make this species easily recognizable. Attracted to UV lights, bait traps.

Subfamily **PARANDRINAE**

General notes: Nocturnal. Distinct 5-segmented, slender tarsi, short antennae, large jaws, in combination with smoothly margined prothorax. Lacking a stridulitrum. Resemble some tenebrionid or lucanid beetles; distinguished from the former by tarsal segmentation and the antennal bases, from the latter also by antennal structure. Closely related to Prioninae. Borers in dead wood.

Tribe **Parandrini**

Parandra b. brunnea (Fabricius) [Fig. 1a-b]

Flight Period: March-November, ENA

Larval Feeding Habits: moist, decaying heartwood of nearly all eastern trees. **Size**: 8-20 mm. **Notes**: occasionally in cavities of living trees, very damaging to structural wood in soil contact, earning it the common name “Pole Borer.” Very unusual appearance for a cerambycid; fairly variable in size and darkness, esp. males. Eyes emarginate. Adults attracted to UV lights.

Parandra polita Say [Fig. 2a-b]

Flight Period: June-July, EUS

Larval Feeding Habits: heartwood of hickory, tuliptree, beech. **Size**: 10-25 mm. **Notes**: distinguished from preceding species by oval, entire (not emarginate) eyes, paired bristles arising from small process between tarsal claws, and more elongate form. Rare in NEUS, but extends to Mesoamerica. Attracted to UV lights.

Subfamily **PRIONINAE**

General notes: Nocturnal, attracted to lights. Generally quite large and robust, prothorax margined and often toothed, jaws strong and sometimes prominent, eyes typically large and feebly emarginate, antennae long, arising low on head and sometimes flattened or imbricated (but not exceeding body length). Sometimes strong sexual dimorphism, females with antennal segments much more slender (though always the same number as the males) and body more massive. Lacking a stridulitrum, but some can produce noise by rubbing legs against body. Tree-associated species often have gregarious larvae, often found in structural wood in soil contact. Some larvae used as food by some native Americans.

Tribe **Macrotomini**

Archodontes m. melanopus (Linnaeus) [Fig. 5]

Flight Period: June-September, SEUS

Larval Feeding Habits: gall-formers on roots of live oak and water oak. **Size**: 30-57 mm. **Notes**: Prothorax with many small marginal teeth is fairly distinctive, though resembling following species (teeth somewhat smaller in general); best distinguished by pronotum being more convex, tapering anteriorly, and with surface sculpture generally smoother. Also with rounded tubercles at antennal bases, mandibles directed more ventrally, not hairy in males. The "Live-oak Root Borer" has been recorded from Virginia.

Stenodontes d. dasytomus (Say) [Fig. 6a-b]

Flight Period: May-October, SNA

Larval Feeding Habits: live heartwood, also stumps, structural wood; many hardwoods, incl. oak, sycamore. **Size**: 20-50 mm. **Notes**: pronotum somewhat flatter and more parallel-sided than preceding species, with pronotal surface sculpture somewhat variable (smooth areas often well-defined against a roughened background); tubercles at antennal bases somewhat angulate and projecting, mandibles directed forward and often hairy in males. The "Hardwood Stump Borer" is often very damaging. Known from as far north as Illinois and Virginia, and south into Mexico.

Tribe **Prionini**

Orthosoma brunneum (Forster) [Fig. 8a-b]

Flight Period: May-November, ENA

Larval Feeding Habits: moist, decaying hardwoods and conifers. **Size**: 25-50 mm. **Notes**: distinguished from *Prionus* species by the 11-segmented antennae which are slender, never flattened, and the elongate, weakly ridged elytra. The "Brown Prionid" is common, attracted to light and bait traps.

Prionus debilis Casey [Fig. 11a-b]

Flight Period: May-November, CUS

Larval Feeding Habits: [similar to *imbricornis*?] **Size**: 20-40 mm. **Notes**: antennae 15-18 segments. Close relative of *P. imbricornis*, generally smaller, paler and more reddish, male antennal punctures larger and more widely spaced. Attracted to UV lights and recorded as far east as Illinois.

Prionus fissicornis Haldeman [Fig. 13]
Flight Period: May-July, CNA
Larval Feeding Habits: root feeder on live native grasses; also corn. **Size**: 25-40 mm. **Notes**: relatively small and pale, antennae with 25-30 segments make this species quite distinctive.

Prionus imbricornis (Linnaeus) [Fig. 12]
Flight Period: April-November, ENA
Larval Feeding Habits: living roots, primarily oak and chestnut, but also grape, pear, corn. **Size**: 25-50 mm. **Notes**: This close relative of *P. debilis* also has antennae with 15-18 segments, but is generally larger, darker brown to black, male antennal punctures smaller and closer spaced. The "Tile-horned Prionus" is often collected at lights.

Prionus laticollis (Drury) [Fig. 9a-b]
Flight Period: June-September, ENA
Larval Feeding Habits: living roots of various trees and shrubs. **Size**: 20-50 mm. **Notes**: antennae with 12-13 segments. Closest to *P. pocularis*, but darker, base of pronotum wider, elytra more wrinkled than punctate, eyes widely spaced, female metasternum hairless. Females of the "Broad-necked Root Borer" are among our most massive longhorns, and are not known to fly. Males attracted to lights.

Prionus pocularis Dalmeister [Fig. 10]
Flight Period: May-August, ENA
Larval Feeding Habits: dead pine logs and stumps. **Size**: 25-45 mm. **Notes**: antennae with 12-13 segments as in *P. laticollis*, but body usually paler, base of pronotum narrower, elytra more punctate, eyes closely spaced, female metasternum hairy. Attracted to lights.

Tribe **Meroscelisini**

Tragosoma depsarius (Linnaeus) [Fig. 7]
Flight Period: June-September, NENA
Larval Feeding Habits: sapwood of decaying pine logs. **Size**: 15-40 mm. **Notes**: elytral sculpture and pronotal spine (only 1, which is distinctive) variably developed. Pronotum hairy, antennae slender. The "Hairy Pine Borer" is most common at higher altitudes (near 5,000 ft.).

Tribe **Solenopterini**

Sphenostethus taslei (Buquet) [Fig. 14a-b]
Flight Period: June-August, EUS
Larval Feeding Habits: dry hardwood snags of oak, chestnut, beech, redbud. **Size**: 20-30 mm. **Notes**: This species is distinctive among NE prionines, and the multi-toothed elytral tips distinguish it from anything else similar in other subfamilies; pronotum untoothed, elytra typically black, smooth and shining aside from punctation. Attracted to UV lights.

Subfamily **SPONDYLIDINAE**

General notes: Characterized by short antennae, elongate jaws, feebly emarginate eyes, expanded front tibiae, in combination with unmargined prothorax, all tarsi with 5 segments evident, but 4th segment very small, hard to see in casual examination.

Lacking a stridulitrum. Only two species in North America, both very unusual and distinctive among longhorns (though difficult to recognize as such). Larvae show similarities to those of Aseminae, and biogeography similar to that subfamily, but the placement of these two groups in a single subfamily is still somewhat controversial, and I retain them as separate here until more conclusive evidence exists.

Tribe **Spondylidini**

Spondylis upiformis Mannerheim [Fig. 4]

Flight Period: May-September, Great Lakes area

Larval Feeding Habits: probably on roots of pine or fir. **Size**: 8-20 mm. **Notes**: shape and structure quite unique; body shining, black, prothorax widest towards front. Mostly western coniferous forest zone species. Diurnal, sometimes attracted to shiny or metallic surfaces.

Scaphinus muticus (Fabricius) [Fig. 3]

Flight Period: June-July, SEUS

Larval Feeding Habits: pine. **Size**: 12-20 mm. **Notes**: also quite unusual in appearance, differing from preceding species in brownish color, duller sculpture, much shorter antennae and prothorax widest at middle. This nocturnal species somewhat resembles a dung beetle (Scarabaeidae), but antennae not clubbed. Range extends up Atlantic coast to Maryland.

Subfamily **LEPTURINAE**

General notes: Antennae long (but not exceeding body length), short second antennal segment, head narrowed behind eyes (sometimes forming a “neck”), eyes either oval and entire or emarginate, prothorax unmargined and often trapezoidal or basally constricted, divided mesonotal stridulitrum (lacking in *Necydalis*). Sexual dimorphism often striking. One of the most abundant groups, with adults of many species frequently encountered on flowers, as they feed on pollen. Often slender or tapering, some species greatly resemble bees or wasps, others are hard to distinguish from some common Meloidae (blister beetles), Oedemeridae, or chrysomelid pests. Nomenclature of the group historically very confusing, and many species have been placed under a variety of generic names. The Necydalini have recently been treated as a separate subfamily, but this placement is only equivocally supported, and I retain the single NE representative within Lepturinae here to reduce confusion.

Tribe **Desmocerini**

Desmocerus palliatus (Forster) [Fig. 221]

Flight Period: April-August, ENA

Larval Feeding Habits: living roots of elderberry. **Size**: 18-26 mm. **Notes**: The metallic blue-violet “Elderberry Borer” is one of our most distinctive and attractive NE longhorns.

Tribe **Necydalini**

Necydalis mellita (Say) [Fig. 175a-b]

Flight Period: May-August, ENA

Larval Feeding Habits: solid, dead heartwood of oak and chestnut, rarely pine. **Size**: 12-22 mm. **Notes**: adults very wasp-like in appearance, with constricted pronotum, very short elytra and long, slender body; distinctive among NE longhorns.

Tribe **Lepturini**

Acmaeops discoideus (Haldeman) [Fig. 74]

Flight Period: May-June, ENA

Larval Feeding Habits: pines. **Size**: 6-9 mm. **Notes**: sculpture and coloration distinctive; base of pronotum developed into broad tubercles projecting laterally, elytra dull black with orange at base and sometimes along margins.

Acmaeops p. proteus (Kirby) [Fig. 73a-b]

Flight Period: May-August, NA

Larval Feeding Habits: inner bark of conifers. **Size**: 7-11 mm. **Notes**: elytra shining, coloration variable, from pale (often with black stripes) to all black, pronotal tubercles dorsal with a median dividing impression. The wedgelike pronotal structure is probably the most distinctive feature of this widespread species. Adults have been attracted to turpentine (more typically found on flowers, as in other Lepturinae).

Acmaeopsoides rufula (Haldeman) [Fig. 75]

Flight Period: May-July, Great Lakes area and extreme NE

Larval Feeding Habits: spruce? **Size**: 8-10 mm. **Notes**: This uncommon species is reminiscent of the preceding genus, but has the eyes notched, and only very weak basal swellings on the pronotum. The pronotum is somewhat angled laterally with shining appressed pubescence, and the elytra are rather uniformly reddish-brown. Apparently ranges along the St. Lawrence River drainage.

Alosternida chalybaea (Haldeman) [Fig. 47]

Flight Period: May-July, EUS

Larval Feeding Habits: ? **Size**: 5-8 mm. **Notes**: dark metallic violet-blue elytra distinctive among NE lepturines, shape of head and prothorax distinguish it from similar members of other subfamilies.

Analeptura lineola (Say) [Fig. 181a-b]

Flight Period: May-August, ENA

Larval Feeding Habits: various hardwoods, esp. birch (also pine). **Size**: 6-12 mm. **Notes**: This common species is probably best recognized by a combination of features; dark, punctate, dorsally arched pronotum, on which the fine golden pubescence often forms an elongate median reflective spot, antennae with banded apical segments, and yellow legs. The elytral coloration is rather variable, typically with marginal and median stripes, but sometimes the median stripes are lost, or they may be broadened and fused with the lateral stripes.

Anastrangalia sanguinea (LeConte) [Fig. 78]

Flight Period: May-August, NNA

Larval Feeding Habits: decaying pine. **Size**: 7-13 mm. **Notes**: This species is easily recognized by its long, almost cylindrical pronotum and short head. The brownish elytra each have two very fine longitudinal ridges. A mostly western species, extending into Rockies and along Pacific Coast.

Anthophylax attenuatus (Haldeman) [Fig. 25]
Flight Period: May-August, NENA
Larval Feeding Habits: moist, decaying hardwood logs, incl. maple, beech. **Size**: 12-17 mm. **Notes**: pronotum with 2 elongate calli, strong lateral spines; elytra with pubescence creating a mottled brown appearance, unique in NE lepturines. Males more slender, and may have elytra more yellowish than females, the pronotum may be darker, but the pronotal structure and mottled pubescence distinctive. Adults reportedly attracted to male pine cones (presumably to feed on pollen).

Anthophylax cyaneus (Haldeman) [Fig. 27]
Flight Period: May-July, NENA
Larval Feeding Habits: various hardwoods (also conifers?). **Size**: 11-16 mm. **Notes**: robust species with a distinctive combination of characters; pronotum metallic, coarsely punctate, legs mostly pale, elytra metallic green (a SE species, *A. hoffmani* Beutenmüller, might be confused with this, but has the pronotum with very deep, crowded punctures and strong lateral tubercles).

Anthophylax viridis LeConte [Fig. 26]
Flight Period: June-July, NENA
Larval Feeding Habits: birch, beech, maple. **Size**: 12-17 mm. **Notes**: somewhat resembling preceding species, but pronotum somewhat duller and more finely punctate, legs black, and elytra with weak longitudinal ridges.

Bellamira scalaris (Say) [Fig. 60a-c]
Flight Period: May-September, ENA
Larval Feeding Habits: various decayed hardwoods (also pine). **Size**: 17-26 mm. **Notes**: distinctive large species, with short head and pronounced "neck," body and elytra bottle-shaped and variably marked with light pubescence, male with expanded abdominal tip. Attracted to UV lights.

Brachyleptura champlaini Casey [Fig. 70a-b]
Flight Period: June-August, ENA
Larval Feeding Habits: pine. **Size**: 8-12 mm. **Notes**: This species has two color forms: elytra generally entirely reddish or brownish, but sometimes dark with long pale lateral stripes (Fig. 70a). Very similar to *B. vagans*, but males have slender, straight hind tibiae and are thus easily separated; females, however, can be quite difficult to separate, as the differences in color forms between the two species can be fairly subtle (though they appear to be consistent). Probably the most visible structural feature is that *champlaini* has slightly denser thoracic punctation, with the spaces between punctures not much greater than the diameter of the punctures themselves.

Brachyleptura circumdata (Olivier) [Fig. 71]
Flight Period: June-July, EUS
Larval Feeding Habits: spruce (possibly pine?). **Size**: 7-10 mm. **Notes**: typically smaller and paler than other species in genus, colored similarly to *Gnathacmaeops pratensis*, but the strongly tapering pronotal shape and strong neck (as in other *Brachyleptura*) are distinctive. Easily separated from the lightest individuals of *B. vagans* and *B. champlaini* by the much less divergent elytral tips, which are also darkened.

Brachyleptura rubrica (Say) [Fig. 68]
Flight Period: May-August, ENA
Larval Feeding Habits: decaying hardwoods incl. hickory, beech, oak. **Size**: 12-18 mm. **Notes**: larger and with the pronotum somewhat angled rather than smoothly tapered anteriorly, elytra uniformly reddish-orange with sparse, strong punctures. Somewhat similar to all-red *Stictoleptura canadensis*, but with the antennae unserrated and banded differently.

Brachyleptura vagans (Olivier) [Fig. 69a-b]
Flight Period: April-August, ENA
Larval Feeding Habits: decaying conifers and hardwoods. **Size**: 8-12 mm. **Notes**: greatly resembles *B. champlaini*, but the color forms do not exactly match that species; light markings in *vagans* most commonly are only basal spots, though sometimes even these are absent, and other individuals have the elytral suture darkened with extensive pale areas (in *champlaini*, the elytra are either completely pale or have only a narrow pale lateral band as shown). The thoracic punctation is not as dense as in *champlaini* (the spaces between punctures are visibly greater than the diameter of the punctures themselves), and males have the hind tibiae bowed, flattened, and irregularly-shaped (polished on inner side; Fig. 69b).

Brachysomida bivittata (Say) [Fig. 31a-d]
Flight Period: April-July, ENA
Larval Feeding Habits: oak?, hickory?, dogwood? **Size**: 7-11 mm. **Notes**: a common species with extremely variable punctation and coloration, most commonly the pronotum is orange with dark spots, but can vary from all orange to all black; sometimes the midline and margins of the pronotum are densely punctate, with appressed hairs; the elytra can be either orange with black stripes or all black, but occasionally may be black with very narrow yellow margins, and may sometimes be fairly pubescent; the legs may be orange or black. Furthermore, these features can occur in virtually any combination, as shown. Nonetheless, the general appearance of this species is different from all other NE longhorns with the possible exception of *Gaurotes thoracica*.

Centrodera decolorata (Harris) [Fig. 39]
Flight Period: May-July, ENA
Larval Feeding Habits: heartwood of both living and dead hardwoods. **Size**: 19-30 mm. **Notes**: This large species is easily recognizable; pronotum polished, with strong lateral tubercles, elytra unicolored, not pubescent. Attracted to lights.

Centrodera quadrimaculatus (Champlain and Knull) [Fig. 30]
Flight Period: May-June, NEUS
Larval Feeding Habits: ? **Size**: 16-18 mm. **Notes**: This very rare species is recognized by the strongly punctate pronotum, yellowish elytra each with two black spots (one dorsal, one subhumeral). At certain angles, the elytra appear almost golden. Known primarily from Ohio.

Centrodera sublineata LeConte [Fig. 41]
Flight Period: March-May, EUS
Larval Feeding Habits: ? **Size**: 11-15 mm. **Notes**: slender shape and appearance

distinctive; pronotum pubescent, elytra pubescent with long bare stripes. Attracted to UV lights.

Charisalia americana (Haldeman) [Fig. 53a-b]

Flight Period: April-July, EUS

Larval Feeding Habits: decayed tuliptree, tupelos. **Size**: 8-11 mm. **Notes**: This rare species has a red head and prothorax, with sharp projecting corners, and black elytra; thus, it greatly resembles *Neoalosterna capitata*, but is distinguished by the strong lateral impressions at base of pronotum, very dull, more densely punctate elytra, and broadened elytral tips.

Cosmosalia chrysocoma (Kirby) [Fig. 102]

Flight Period: June-September, NNA

Larval Feeding Habits: decaying conifers and hardwoods. **Size**: 10-20 mm. **Notes**: The very dense, appressed, metallic golden elytral pubescence is quite distinctive. Range extensive in West, down into Mexico.

Encyclops caerulea (Say) [Fig. 42]

Flight Period: May-July, ENA

Larval Feeding Habits: outer bark of living hardwoods, esp. oak, maple, rarely pine. **Size**: 7-11 mm. **Notes**: a slender metallic species with yellow legs; pronotal shape and surface sculpturing are distinctive. The "Oak Bark Scaler" causes largely cosmetic damage.

Evodinus m. monticola (Randall) [Fig. 87a-b]

Flight Period: May-July, NENA

Larval Feeding Habits: mine beneath conifer bark. **Size**: 8-13 mm. **Notes**: The basally constricted pronotum with dense golden hairs, and very pale elytra with black markings make this species quite distinctive, though the markings are somewhat variable in extent.

Gaurotes cyanipennis (Say) [Fig. 29]

Flight Period: May-August, NENA

Larval Feeding Habits: beneath bark of numerous hardwoods and shrubs. **Size**: 9-13 mm. **Notes**: This robust, metallic blue-green species with yellow legs can be readily recognized by the smooth elytra, gradually tapering pronotum, and strongly bulging mesosternum (protruding in front of middle coxae).

Gaurotes thoracica (Haldeman) [Fig. 32]

Flight Period: May-July, ENA

Larval Feeding Habits: ? **Size**: 9-10 mm. **Notes**: This very rare but widely distributed species resembles a dark form of the common *Brachysomida bivittata*, (black with reddish-orange pronotum), but can be easily distinguished by the pronotum, which is punctate and pubescent *except* along the midline and margins. The elytra are slightly more metallic greenish-tinted, as well, and always have dark lateral margins (frequently pale in *B. bivittata*), and the legs are generally dark with reddish tibial bases, but sometimes the femora are also reddish. The underside is always dark, often with a reddish metepisternum.

Gnathacmaeops pratensis (Laicharting) [Fig. 72]

Flight Period: May-July, NA

Larval Feeding Habits: spruce, pine. **Size**: 5-9 mm. **Notes**: This short-bodied, dark species with pale elytra is somewhat similar in appearance to both *Acmaeops proteus* and *Brachyleptura circumdata*, but the dorsal surface of the pronotum is smoothly rounded, and the head is very elongate with entire eyes, and not constricted to form a neck.

Grammoptera exigua (Newman) [Fig. 50]

Flight Period: May-July, NENA

Larval Feeding Habits: dead branches of poplar, linden. **Size**: 4-7 mm. **Notes**: this and following species generally similar in appearance, with their small size and shape rather distinctive among NE longhorns, and separation can be difficult without a microscope; *exigua* has the pronotum slightly less elongate than the other species, typically orange with black central spot, with very fine, roughened punctation, and the females have a small tubercle on the last abdominal sternite. Rare individuals with a fully black prothorax can best be distinguished by the pronotal shape and punctation, as well as the female sternite. Some very small oedemerid and cantharid beetles resemble this and the following species, best recognized by the laminate-edged pronotal disc.

Grammoptera haematites (Newman) [Fig. 51]

Flight Period: April-July, ENA

Larval Feeding Habits: various shrubs. **Size**: 4-7 mm. **Notes**: This common species has the pronotum typically entirely reddish, more elongated than in preceding species, and with coarser punctation. The head is black except for the clypeus, and the basal antennal segments and legs are mostly reddish (scape reddish beneath). Occasional individuals can also be found with a black prothorax, especially in the Great Lakes vicinity and farther north, and these can be distinguished with some difficulty from *G. ruficeps* and *G. subargentata* by the slightly different-shaped pronotum, the faintly impressed medial line which has outward-directed hairs, and from *subargentata* by the pale elytral hairs and the distinct reddish underside of the antennal scape.

Grammoptera ruficeps (LeConte) [Fig. 49]

Flight Period: April-July, NENA

Larval Feeding Habits: various hardwoods, incl. dogwood. **Size**: 5-8 mm. **Notes**: This uncommon species is virtually identical structurally to the following species (and may prove to be only a color form), differing in the coloration of the head and pubescence. The head is largely or entirely red, body and pronotum always black, the legs and antennal bases reddish. The pubescence of the elytra and pronotum is fairly dense and entirely pale golden. The pronotum is slightly more elongate and with more distinct punctures than in *G. haematites*, and lacks a medial depression; the hairs along the midline all point straight backwards.

Grammoptera subargentata (Kirby) [Fig. 48]

Flight Period: April-August, NA

Larval Feeding Habits: various hardwoods, incl. sumac, poplar, oak. **Size**: 5-8 mm. **Notes**: very similar to the preceding species, with body and pronotum always black, though legs, antennal bases, and sometmes clypeus may occasionally be partially reddish. If the scape is reddish, it is diffusely and usually completely so, rather than the distinct reddish underside and black upper surface as in *G. haematites*. Separated best from preceding three species by entirely dark, shining elytral pubescence, and pronotal pubescence dark or somewhat silvery, never golden. Widespread and common, the vast majority of all-black NE *Grammoptera* specimens will belong to this species. Checking collections for rare black individuals of the preceding species can be time-consuming, and is best done with a stereo microscope.

Idiopidonia pedalis (LeConte) [Fig. 43]

Flight Period: June-July, NENA

Larval Feeding Habits: ? **Size**: 8-11 mm. **Notes**: Though rather ordinary in appearance, there are no other NE longhorns that precisely resemble this uncommon species; the dull, pubescent pronotum with narrow shining midline, and elongate, almost parallel-sided body will separate this from genera such as *Pidonia* and *Strangalepta.*

Judolia cordifera (Olivier) [Fig. 85]

Flight Period: May-August, ENA

Larval Feeding Habits: chestnut. **Size**: 8-12 mm. **Notes**: Members of this genus somewhat resemble *Typocerus*, but antennae not serrated. Females of this species can be separated from *J. instabilis* by the denser, longer elytral pubescence (arising from fine, dense punctures), the narrower, pointed elytral tips, and the relatively weak black markings at the basal third of the elytra (typically reduced to only a lateral spot). The hairs of the pronotum are also slightly hooked at the tips, a feature not seen in *instabilis.* Males can be easily recognized by a strong medio-basal protuberance and apical concavity on the final sternite, and the hind tibiae are lined ventrally with distinct, irregular tubercles.

*?**Judolia instabilis*** (Haldeman) [Fig. 84a-b]

Flight Period: May-September, NNA

Larval Feeding Habits: pine. **Size**: 6-15 mm. **Notes**: This species has an extensive range and is abundant in the montane west, and has also been recorded from northern Ontario, but this report is likely to be in error (the closest confirmed locality is in northern Manitoba). Females can be separated from *J. cordifera* by the sparser, shorter elytral pubescence (arising from coarser punctures), the broader, more rounded elytral tips (though apically divergent), and the generally strong black markings at the basal third of the elytra, often forming a complete or narrowly broken band. Occasional specimens are almost entirely black, but with the area lateral to the humerus pale. The final male tergite is essentially unmodified, and the hind tibial tubercles are smaller than in *cordifera.*

Judolia m. montivagans (Couper) [Fig. 88a-b]

Flight Period: June-August, NA

Larval Feeding Habits: conifers, also willow and poplar. **Size**: 7-12 mm. **Notes**: quite different from preceding two species, with relatively long and slender antennae, elytra not nearly so strongly tapering (with tips closer together, as well) and less pubescent, pale areas more cream-colored, though variable in extent (as shown) and irregular in shape. Males lack tubercles on the hind tibiae. Range of this subspecies excludes only Pacific Coast.

Judolia quadrata (LeConte) [Fig. 86a-b]
Flight Period: July, NNA
Larval Feeding Habits: [conifers?] **Size**: 7-10 mm. **Notes**: This rare species is somewhat intermediate in appearance between the preceding two species; males tend to resemble *J. instabilis* in their markings, but structurally and in body shape much more resemble *J. montivagans*. Further distinguished from *instabilis* by the extremely short, fine pronotal pubescence (especially visible in males), and the absence of ventral tubercles on the male hind tibiae. In addition to the weaker pronotal pubescence, the antennae of both sexes are much shorter than in *montivagans*. All known females of this species have the elytra mostly dark with several small pale markings laterally, as shown.

Leptorhabdium pictum (Haldeman) [Fig. 38]
Flight Period: May-June, EUS
Larval Feeding Habits: various hardwoods incl. birch, oak, hickory. **Size**: 9-17 mm. **Notes**: a pale, slender species somewhat similar to *Centrodera*, but with very distinctive coloration.

Leptura abdominalis (Haldeman) [Fig. 63a-c]
Flight Period: May-July, EUS
Larval Feeding Habits: bald cypress, juniper. **Size**: 12-18 mm. **Notes**: This uncommon, robust species is quite variably colored, with almost entirely orange individuals, others entirely black, and many different intermediate combinations. The pronotum most commonly has two black spots, which sometimes fuse, and the elytra are often black with orange stripes. The all-black individuals can be separated from all-black *L. plebeja* by the banded antennae and sharp-spined, strongly divergent elytral tips.

Leptura emarginata Fabricius [Fig. 61]
Flight Period: April-August, EUS
Larval Feeding Habits: various decaying hardwoods, incl. elm, beech. **Size**: 25-35 mm. **Notes**: This large, bright scarlet and black species with serrate antennae is distinctive among NE longhorns.

Leptura obliterata deleta (LeConte) [Fig. 64]
Flight Period: July-August, NEUS
Larval Feeding Habits: ? **Size**: 11-16 mm. **Notes**: a very rare subspecies of a common, generally western species, distinguished from other *Leptura* by strong, dense pronotal punctures, and elytral markings limited to poorly defined medial and subapical spots (reminiscent of *Strangalia famelica*, though the more robust body and the pronotum with sinuate basal margin with a strong median crease easily distinguish this and other *Leptura* from members of other genera).

Leptura plebeja Randall [Fig. 65a-b]
Flight Period: June-August, NENA
Larval Feeding Habits: spruce, pine. **Size**: 9-14 mm. **Notes**: This fairly common species has two color forms, one with pale brownish elytra, the other all black; the all-black form is best distinguished from all-black *L. abdominalis* by the darker antennae and weakly-spined, less divergent elytral tips.

Leptura subhamata Randall [Fig. 59a-b]
Flight Period: June-August, NENA
Larval Feeding Habits: decaying hemlock, pine. **Size**: 11-17 mm. **Notes**: pronotum relatively slender, elytra distinctively patterned; extent of black varies from small median markings and thin margins to thick margins surrounding small pale areas, as shown.

Lepturopsis biforis (Newman) [Fig. 82]
Flight Period: June-August, ENA
Larval Feeding Habits: decaying hardwoods and conifers. **Size**: 12-16 mm. **Notes**: The well-defined midline and basal grooves in pronotum, and the brownish elytra with small black lateral spots make this species distinctive.

Lycochoriolaus lateralis (Olivier) [Fig. 231]
Flight Period: March-June, SEUS
Larval Feeding Habits: ? **Size**: 7-11 mm. **Notes**: a small, slender species, the one mimic of lycid beetles among NE lepturines (easily distinguished from those in other subfamilies by its head and prothorax), with markings developed to varying degrees, but generally as shown. Range extends to southern Mexico.

Metacmaeops vittata (Swederus) [Fig. 180]
Flight Period: May-July, ENA
Larval Feeding Habits: tuliptree, chestnut. **Size**: 6-8 mm. **Notes**: a small species, usually with orange head and pronotum, but sometimes darkened, with a dark median stripe on each elytron. The markings and shape, along with the generally light body color and entire eyes, make this species fairly distinctive, and males have strong toothlike projections on the fore tibiae.

Neoalosterna capitata (Newman) [Fig. 52]
Flight Period: May-July, ENA
Larval Feeding Habits: birch. **Size**: 8-10 mm. **Notes**: This species closely resembles *Charisalia americana*, but has a much weaker impression across the pronotal base, as well as shinier, more sparsely punctate, and more tapering elytra.

Pachyta lamed liturata Kirby [Fig. 89a-b]
Flight Period: June-October, NNA
Larval Feeding Habits: conifers. **Size**: 11-21 mm. **Notes**: robust, hairy species, elytra typically reddish with vague black markings, though sometimes all black, but pronotal shape quite distinctive. Also occurs throughout montane west.

Pidonia aurata (Horn) [Fig. 183]
Flight Period: May-July, Atlantic Coast
Larval Feeding Habits: ? **Size**: 7-10 mm. **Notes**: Like the other *Pidonia* species, *aurata* has a strongly constricted neck and an almost spherically swollen pronotum; this species is distinguished by the reddish body and appendages, and mostly light elytra that are narrowly darker along margins. This coloration is quite constant.

Pidonia densicollis (Casey) [Fig. 184]
Flight Period: May-June, Atlantic Coast
Larval Feeding Habits: ? **Size**: 7-9 mm. **Notes**: This Appalachian species has the elytra much darker than the preceding species, with yellow median stripes. The pronotum is

mostly black, though sometimes with yellow anterior or posterior margins. The head and pronotum are punctate and pubescent, unlike the following species, and the elytra are slightly duller.

Pidonia ruficollis (Say) [Fig. 185a-b]
Flight Period: May-July, ENA
Larval Feeding Habits: numerous hardwoods. **Size**: 6-9 mm. **Notes**: color quite variable; the pronotum varies from red to black and the elytra vary from black to black with yellow median stripes. Some of these individuals thus strongly resemble the preceding species, but the head and pronotum are almost impunctate and thinly haired and the elytra are slightly shinier.

Pseudogaurotina abdominalis (Bland) [Fig. 28]
Flight Period: May-July, NENA
Larval Feeding Habits: ? **Size**: 9-16 mm. **Notes**: strongly resembles a less robust form of *Gaurotes cyanipennis*, but has the elytra more distinctly punctate, pronotum more constricted at base, and a normal mesosternum.

Pseudostrangalia cruentata (Haldeman) [Fig. 46]
Flight Period: May-June, ENA
Larval Feeding Habits: ? **Size**: 8-12 mm. **Notes**: The shining pronotum with sharp corners and the elytra with red margins and pointed tips are distinctive; this uncommon species might be mistaken for a small *Typocerus* but lacks dense hair bands on the pronotum, and the antennae are not serrated. Attracted to UV lights.

Pygoleptura n. nigrella (Say) [Fig. 66a-b]
Flight Period: May-September, NNA
Larval Feeding Habits: decaying conifer heartwood. **Size**: 11-23 mm. **Notes**: The shape and sculpturing of this species are unmistakable and somewhat intermediate between a *Leptura* and *Stictoleptura*; the pronotum is somewhat squarish, punctate with a strong transverse basal crease, and the head is short with a broad neck and slightly serrate antennae. The elytra are usually brownish-red, occasionally entirely black, and weakly punctate.

Rhagium inquisitor (Linnaeus) [Fig. 24]
Flight Period: February-July, NA
Larval Feeding Habits: bore in cambium of various conifers. **Size**: 9-21 mm. **Notes**: variable in both coloration and size (once considered multiple species), but nonetheless quite distinctive from all other NA longhorns in shape, sculpturing, and antennae. The “Ribbed Pine Borer” is Holarctic in distribution.

Sachalinobia r. rugipennis (Newman) [Fig. 23]
Flight Period: May-August, NENA
Larval Feeding Habits: spruce, pine. **Size**: 10-16 mm. **Notes**: The reticulate elytral sculpturing makes this uncommon species unique and unmistakable among NA longhorns. Adults have been attracted to turpentine.

Stenocorus cinnamopterus (Randall) [Fig. 35a-b]
Flight Period: April-July, NEUS
Larval Feeding Habits: hydrangea, cherry, *Euonymus*. **Size**: 10-16 mm. **Notes**: similar

in general appearance to other species in the genus, but uniformly brownish, with small but distinct lateral pronotal tubercles and rounded elytral apices. Females are somewhat more densely clothed with golden pubescence than males. Attracted to UV lights.

Stenocorus cylindricollis (Say) [Fig. 33]

Flight Period: May-August, ENA

Larval Feeding Habits: hickory, sumac. **Size**: 12-22 mm. **Notes**: somewhat variable in color, though head and thorax often darker than elytra; recognizable by outer tips of elytra produced into points, and very short basal antennal segments (especially third). Attracted to bait traps.

Stenocorus schaumii (LeConte) [Fig. 34a-b]

Flight Period: May-August, NENA

Larval Feeding Habits: various hardwoods incl. ash, maple. **Size**: 17-30 mm. **Notes**: This large species is easily recognized; pronotum shining, usually orange, with strong lateral projections; elytra black, wrinkled, and dull. Attracted to UV lights.

?Stenocorus trivittatus (Say) [Fig. 37]

Flight Period: June-July, CNA

Larval Feeding Habits: ? **Size**: 12-16 mm. **Notes**: elytra with distinctive coloration; reddish at sides with thin black stripes bordering median yellow stripes. Rare species, reported from Missouri but unconfirmed.

Stenocorus vittiger (Randall) [Fig. 36]

Flight Period: May-July, NENA

Larval Feeding Habits: various shrubs. **Size**: 12-20 mm. **Notes**: elytra somewhat shining, with pale stripes on black background, little pubescence, and antennae relatively long and slender.

Stictoleptura c. canadensis (Olivier) [Fig. 67a-b]

Flight Period: May-August, NENA

Larval Feeding Habits: various conifers (occasional hardwoods). **Size**: 10-15 mm. **Notes**: elytra usually black with a red base, but occasionally entirely red; the alternating colors on the serrated antennae (rarely all black), pronotal form, and strong punctation are quite distinctive among NE longhorns.

Strangalepta abbreviata (Germar) [Fig. 182a-b]

Flight Period: May-August, ENA

Larval Feeding Habits: various decaying conifers and hardwoods. **Size**: 10-14 mm. **Notes**: This variable species can have the elytra entirely black or pale, but most commonly there is only an abbreviated pale stripe. It has a relatively globose pronotum (without an apical collar as in *Pidonia*), which, like the elytra, is weakly punctate with short pubescence. Males of this and the following species have a small tubercle on the inside of the hind tibiae.

Strangalepta pubera (Say) [Fig. 44]

Flight Period: May-July, NENA

Larval Feeding Habits: elm, walnut, pine. **Size**: 8-12 mm. **Notes**: resembles the all-black form of the preceding species, but pronotum and elytra more strongly punctate, pubescence longer, and the body much less elongate.

Strangalia acuminata (Olivier) [Fig. 62]
Flight Period: June-July, ENA
Larval Feeding Habits: various shrubs and hardwoods. **Size**: 8-12 mm. **Notes**: smallish, distinguished from other *Strangalia* by antennae, head and prothorax always black, elytra varying from largely brownish with black edges to all black in more southern populations (the extremely slender, arched form common to this genus makes such specimens recognizable from other all-black longhorns).

Strangalia bicolor (Swederus) [Fig. 54]
Flight Period: May-July, C & EUS
Larval Feeding Habits: maple, oak. **Size**: 11-15 mm. **Notes**: distinctive appearance; antennae, head, and prothorax always yellowish-orange, elytra dark.

Strangalia famelica Newman [Fig. 57a-c]
Flight Period: May-July, Atlantic Coast
Larval Feeding Habits: chestnut, oak, birch. **Size**: 10-17 mm. **Notes**: antennae black, elytra variable, but generally with at least two pairs of dark spots, at middle and near tip, with abdominal tip greatly expanded in male, female abdomen usually reddish. Restricted to east of Appalachians.

Strangalia luteicornis (Fabricius) [Fig. 56]
Flight Period: May-August, ENA
Larval Feeding Habits: various hardwoods and shrubs. **Size**: 9-14 mm. **Notes**: This common species somewhat resembles *S. famelica*, but antennae and much of body pale, generally yellow, and elytral spots more well-developed, though slightly variable. Attracted to UV lights, bait traps.

Strangalia sexnotata Haldeman [Fig. 55a-b]
Flight Period: May-August, SNA
Larval Feeding Habits: ? **Size**: 8-13 mm. **Notes**: This generally southern species is distinguishable from other *Strangalia* by its less elongate form, relatively bristly elytral pubescence, and strong elytral spots; color form that extends into Missouri has first few antennal segments black, light legs, and elytra with six discrete spots, while the coastal form recorded from Virginia has more completely darkened appendages.

Strangalia solitaria Haldeman [Fig. 58a-c]
Flight Period: May-September, ECUS
Larval Feeding Habits: birch, oak. **Size**: 10-17 mm. **Notes**: closely related and similar to *S. famelica*, but differs in lacking or almost lacking spots in middle of elytra, and sometimes pronotum entirely pale; in males, abdominal tip not greatly expanded, in females, abdomen usually black. Some individuals may have an all-dark pronotum and almost unmarked elytra, resembling *S. acuminata*, but the light legs will separate them. Restricted to western side of Appalachians, fairly common. Attracted to UV lights, bait traps.

Strophiona nitens (Forster) [Fig. 101]
Flight Period: May-July, C & ENA
Larval Feeding Habits: living or dead hardwoods, incl. chestnut, oak, hickory. **Size**: 10-15 mm. **Notes**: This very attractive species is distinctive among NE longhorns. The

"Chestnut Bark Borer" slightly resembles some *Typocerus*, but pronotum strongly constricted towards base, more rounded at corners, and pubescence metallic yellow. Attracted to UV lights.

Trachysida aspera brevifrons (Howden) [Fig. 76]

Flight Period: June-July, NENA

Larval Feeding Habits: decaying fir, spruce. **Size**: 8-16 mm. **Notes**: This and the following ordinary-looking species can be distinguished from similar members of other genera (e.g., *Anastrangalia sanguinea*) by the smoothly granulate surface and truncated cone shape of the pronotum, plus the rounded outer elytral tips. In both species of *Trachysida*, there are two color forms: one all-black, and the other black with light brownish elytra. In *aspera brevifrons*, however, the elytral surface is always entirely opaque between the punctures, which are somewhat crowded at the midline towards the base.

Trachysida mutabilis (Newman) [Fig. 77a-b]

Flight Period: April-July, ENA

Larval Feeding Habits: decaying hardwoods. **Size**: 8-15 mm. **Notes**: similar to the preceding species, but either color form of *mutabilis* can be separated by the visibly shining elytral surface (especially basally) between more uniformly spaced punctures.

Trigonarthris atrata (LeConte) [Fig. 79]

Flight Period: May-June, SEUS

Larval Feeding Habits: [elm?] **Size**: 13-18 mm. **Notes**: This rare species is best separated from the following two by having a more weakly pubescent pronotum with clearly separated punctation and a relatively deep median depression; also, the elytral coloration tends to be slightly more reddish-orange and the body slightly broader. It is further separated from *T. minnesotana* by having epipleural margin more weakly convex (as in *T. proxima*). The male has the last sternite notched, but not as deeply as in *proxima*, and the females may or may not have a weak ridge on the pygidium, so these characters are not as reliable as the pronotal features to distinguish this pair of species.

Trigonarthris minnesotana (Casey) [Fig. 80a-c]

Flight Period: May-August, ENA

Larval Feeding Habits: various hardwoods (also pine). **Size**: 13-18 mm. **Notes**: This species is readily distinguished from *T. atrata* and *T. proxima* by the modifications of the abdominal tips in the different sexes. In this species, the last male sternite lacks a notch (at most the apex is slightly concave) and the female lacks a ridge on the pygidium. Further, the epipleural margin is strongly convex. The legs and underside also tend to be more densely clothed with shining golden pubescence (the underlying punctation is about twice as dense on the sternites).

Trigonarthris proxima (Say) [Fig. 81a-d]

Flight Period: May-August, ENA

Larval Feeding Habits: various decaying hardwoods, incl. maple, hickory. **Size**: 13-20 mm. **Notes**: In this species, the last male sternite has a very elongate triangular notch and the female has a corresponding strong ridge on the pygidium, which apparently fits into the male notch during mating (an external "lock-and-key" structure). The pronotum is quite pubescent, with crowded punctures and a relatively shallow median depression. The legs and underside are less visibly clothed with golden pubescence than in *T. minnesotana* and the elytral margin below the humerus is not as strongly convex. Attracted to UV lights.

Typocerus a. acuticauda Casey [Fig. 99]
Flight Period: May-September, ENA
Larval Feeding Habits: ? **Size**: 9-14 mm. **Notes**: somewhat variable in color, usually reddish with small yellow markings, though these may be slightly larger or absent altogether; possible to confuse with the more weakly-marked individuals of *T. velutinus*, but the pronotum has an unusual layer of slightly curled hairs below a set of very erect hairs (instantly recognizable under magnification, though still possible to distinguish with the naked eye with some practice) and a very fine glabrous midline, while the elytral tips come to a single strong point. Also as in *velutinus*, there is a southern subspecies where the reddish color is darkened to black and the yellow markings form complete bands, but the thoracic hairs and elytral tips are still distinctive.

Typocerus confluens Casey [Fig. 97a-b]
Flight Period: June-August, CNA
Larval Feeding Habits: ? **Size**: 11-15 mm. **Notes**: quite variable in color, elytral ground color varying from reddish to black, with yellow markings generally small (medial markings often connected along suture, as shown), sometimes almost absent. Closely related to and difficult to distinguish from *T. octonotatus*; however, the last male abdominal sternite is very deeply concave at tip, while the female pygidium has a pronounced pubescent swelling (a "lock-and-key" structural feature similar to that seen in *Trigonarthris*). Range extends from CNA eastward to Indiana.

Typocerus deceptus Knull [Fig. 100]
Flight Period: June-July, EUS
Larval Feeding Habits: ? **Size**: 11-17 mm. **Notes**: This uncommon species is rather similar to *T. velutinus* at first glance, with the yellow markings small and unconnected along suture, but is distinctive in having a broad interruption in the middle of the basal pronotal hair band, no apical pronotal hair band, and the tips of the elytra are rather abruptly and strongly tapered (i.e., the lateral elytral margin is strongly sinuate). Somewhat limited range, mostly east-central US.

Typocerus lugubris (Say) [Fig. 45]
Flight Period: May-August, ENA
Larval Feeding Habits: pines. **Size**: 8-12 mm. **Notes**: distinguished by solid black coloration (except for a tiny pale spot laterally on epipleural area); also, the pronotum has no erect hairs, only weak, pale apical and basal hair bands, and the elytra also lack erect hairs.

Typocerus l. lunulatus (Swederus) [Fig. 90]
Flight Period: May-August, Atlantic Coast & SEUS
Larval Feeding Habits: pines. **Size**: 8-12 mm. **Notes**: elytra black with two discrete basal yellow spots. It is apparently possible to find specimens from a single locality that have these spots variously fused together, including individuals almost indistinguishable

from the following subspecies, but for now I keep the subspecies separate.

Typocerus lunulatus texanus Linsley and Chemsak [Fig. 91]

Flight Period: May-July, SCUS

Larval Feeding Habits: ? **Size**: 8-12 mm. **Notes**: elytra with more yellow than nominate subspecies; basal spots fused almost completely, often with small apical marks. Recorded from Missouri.

Typocerus octonotatus (Haldeman) [Fig. 96a-b]

Flight Period: May-August, C & EUS

Larval Feeding Habits: borers in native grasses. **Size**: 10-15 mm. **Notes**: This common species was incorrectly known under the name *T. sinuatus* between 1850 and 1976, and not all US museum material has been updated. The yellow markings may be quite reduced, though the pattern is fairly distinctive, aside from well-marked specimens of *T. confluens*. The small depression on the last male sternite and smaller swelling on the female pygidium will permit separation from that species. All forms of this and *confluens* may be easily separated from *T. velutinus* by the erect pronotal hairs.

?Typocerus sinuatus (Newman) [Fig. 95]

Flight Period: March-August, SNA

Larval Feeding Habits: ? **Size**: 9-14 mm. **Notes**: This uncommon species was not correctly known until recently and its precise geographic limits are unclear. The elytral markings are much more clearly defined and less variable than in the very similar *T. octonotatus*, and the complete transverse dark band at base (sometimes also at middle) also is distinctive.

Typocerus sparsus LeConte [Fig. 92]

Flight Period: June-August, Great Lakes area

Larval Feeding Habits: decaying pine. **Size**: 7-10 mm. **Notes**: This black and yellow-marked species with orange legs resembles a small version of *T. zebra*, but the basal yellow elytral markings are not triangular and the pronotum is also distinctive; there are only weak, pale basal and apical hair bands and the surface is otherwise coarsely punctate with sparse, suberect hairs.

Typocerus v. velutinus (Olivier) [Fig. 98a-c]

Flight Period: May-September, ENA

Larval Feeding Habits: various decaying hardwoods, incl. oak, hickory. **Size**: 9-16 mm. **Notes**: This common species is quite variable in color, mostly in the extent of the yellow markings (never connected along the suture). The pronotum is densely covered with appressed golden pubescence and the basal and apical hair bands are strong and complete. As in *T. acuticauda*, there is a southern subspecies where the reddish color is darkened to black and the yellow markings form complete bands, but again the thoracic hairs and elytral tips are different. Attracted to UV lights.

Typocerus zebra (Olivier) [Fig. 93]

Flight Period: March-August, Atlantic & Gulf coasts

Larval Feeding Habits: pines. **Size**: 10-16 mm. **Notes**: The elytral markings of this species are quite uniform and distinctive, particularly the small triangular basal yellow marks; additionally, the pronotum is coarsely punctate, lacks the layer of appressed pubescence seen in other species (though fine, erect hairs are still present), and is bordered on all four sides by dense golden hair bands. Occasionally in interior states.

Xestoleptura octonotata (Say) [Fig. 94]

Flight Period: May-July, ENA

Larval Feeding Habits: oak. **Size**: 11-14 mm. **Notes**: In this and the following species, the base of each elytron has a small lobe that fits into a corresponding arch in the basal margin of the pronotum, though this can be difficult to see. The markings of this species are quite distinctive; elytra dark with four yellow spots of various sizes (rarely joining in middle). The body is somewhat elongate and largely shining.

Xestoleptura tibialis (LeConte) [Fig. 83a-b]

Flight Period: June-September, NNA

Larval Feeding Habits: decaying conifers. **Size**: 9-16 mm. **Notes**: This species is less elongate than the preceding, with a very dull pronotal surface; the elytra are slightly dull, largely light brownish, with black areas somewhat variable in size, especially at apex where they may fuse (thus somewhat resembling *Leptura obliterata deleta*). Range extends throughout Rockies.

Subfamily **ASEMINAE**

General notes: Characterized by short antennae, unmargined prothorax, short broad head (not narrowed behind eyes), eyes partially or completely divided into lobes, elongate second antennal segment, divided mesonotal stridulitrum (lacking in *Tetropium*). Somewhat difficult to recognize as longhorns, and therefore relatively easy to separate from those of other subfamilies. Mostly dull species without much sexual dimorphism, generally associated with conifers.

Tribe **Asemini**

Arhopalus foveicollis (Haldeman) [Fig. 16]

Flight Period: June-August, NENA

Larval Feeding Habits: bases of dead pine and spruce trees. **Size**: 14-30 mm. **Notes**: eyes not hairy; pronotal surface irregular, with a pair of deep pits; elytra with distinct ridges. The range extends westward to overlap that of a similar western species, *A. asperatus* (LeConte), which is possibly only a variant of *foveicollis*. Attracted to lights.

Arhopalus rusticus obsoletus (Randall) [Fig. 15]

Flight Period: June-September, ENA

Larval Feeding Habits: bases and roots of dead pines. **Size**: 15-25 mm. **Notes**: eyes hairy, pronotal surface smoother, with shallow depressions, elytral duller with weak ridges. Also extends more westward in northern forests, south to Mesoamerica. Attracted to UV lights. There is a possible record of a southeastern subspecies, *A. rusticus nubilus* (LeConte), from Indiana; it is virtually indistinguishable, but is slightly darker, with coarser sculpture beneath the head, slightly more projecting mandibles, and a slightly more smoothly convex pronotum. A somewhat similar western species, *A. productus* (LeConte), has been collected in Ontario and Iowa; it is distinctly more elongated and slender.

Asemum australe LeConte [Fig. 18]
Flight Period: June-July, Atlantic & Gulf coasts
Larval Feeding Habits: ? **Size**: 11-16 mm. **Notes**: close to following species, but apical antennal segments longer, elytra slightly shinier and smoother. Eyes not completely divided as in *Tetropium*. Rare.

Asemum striatum (Linnaeus) [Fig. 17a-b]
Flight Period: April-July, NA
Larval Feeding Habits: recently dead, fallen, or standing trees or stumps of various conifers, esp. pine. **Size**: 10-18 mm. **Notes**: apical antennal segments shorter than in preceding species; elytra dull, striate, generally dark but light-colored variants occur. Also occurs in Europe and across Asia. Adults diurnal, but also attracted to lights; one of the more common asemines.

Tetropium cinnamopterum Kirby [Fig. 21]
Flight Period: May-July, NNA
Larval Feeding Habits: mines beneath bark of living and dying pine, fir. **Size**: 8-15 mm. **Notes**: pronotum shining, with small, well-spaced punctures and weak pubescence; elytra typically reddish. The "Eastern Larch Borer" is difficult to separate from the following species; a further diagnostic feature (requiring a microscope) is that the lower eye lobes are roughly twice the size of the upper lobes.

Tetropium parvulum Casey [Fig. 22]
Flight Period: June-August, NNA
Larval Feeding Habits: spruce. **Size**: 8-14 mm. **Notes**: distinguished with some difficulty from preceding species by a much more sparsely punctate pronotum, especially anteriorly; elytra typically more brownish and lower eye lobes much less than twice the size of upper lobes. A mostly northwestern forest species, though not uncommon near the Great Lakes.

Tetropium schwarzianum Casey [Fig. 19]
Flight Period: June-July, NEUS
Larval Feeding Habits: pine. **Size**: 11-15 mm. **Notes**: difficult to distinguish from *T. cinnamopterum* (and it has been suggested that it is possibly only a subspecies), but has pronotum with pubescence and distinct punctures relatively dense, surface fairly shiny underneath pubescence.

Tetropium velutinum LeConte [Fig. 20]
Flight Period: May-August, Great Lakes area
Larval Feeding Habits: mines beneath bark of living larch, hemlock, fir. **Size**: 10-20 mm. **Notes**: somewhat similar to *T. schwarzianum*, but pronotum distinctively dull and granulate with only fine pubescence. Elytra vary from brown (as shown) to black. A mostly northwestern forest species.

Tribe **Atimiini**

Atimia c. confusa (Say) [Fig. 284]
Flight Period: April-August, ENA
Larval Feeding Habits: under bark of cedars, junipers, and cypresses. **Size**: 6-9 mm. **Notes**: This attractive species resembles a small lamiine, but markings and shape are

quite distinctive. The "Small Cedar-bark Borer" is attracted to UV lights.

Tribe **Michthisomini**

Michthisoma heterodoxum LeConte [Fig. 208]

Flight Period: April-June, SEUS

Larval Feeding Habits: sapwood of hickory, oak. **Size**: 5-9 mm. **Notes**: This very unusual and rare species greatly resembles an ant and cannot be mistaken for any other NE longhorn. Apparently restricted to mountains from Georgia north to Virginia.

Subfamily **CERAMBYCINAE**

General notes: Long antennae (sometimes longer than body) inserted high on head; head essentially projecting forwards, not narrowed behind eyes; eyes deeply lobed, short second antennal segment; unmargined prothorax (often cylindrical or ovoid); undivided mesonotal stridulitrum (lacking in *Callidium*). The largest and most diverse subfamily in appearance and habits.

Tribe **Smodicini**

Smodicum cucujiforme (Say) [Fig. 172]

Flight Period: June-September, NEUS

Larval Feeding Habits: dry heartwood of various hardwoods incl. oak, hickory, maple. **Size**: 7-10 mm. **Notes**: Not easily confused with other northeastern species, the "Flat Powder-post Beetle" is small, pale, shining, and extremely flattened. As the name implies, it resembles a flat bark beetle (Cucujidae), but the tarsi and antennal structure distinguish it. Attracted to UV lights.

Tribe **Oemiini**

Oeme r. rigida (Say) [Fig. 133]

Flight Period: June-September, EUS

Larval Feeding Habits: juniper, bald cypress, rarely pine. **Size**: 6-20 mm. **Notes**: This uncommon, nocturnal species has a distinctive appearance; pale, elongate body with strongly constricted pronotal base and prickly antennae.

Tribe **Methiini**

Methia pusilla (Newman) [Fig. 173]

Flight Period: April-June, SEUS

Larval Feeding Habits: borers in branches of live oak (possibly swamp cypress). **Size**: 5-9 mm. **Notes**: elytra soft, shortened slightly and typically pale; eyes large, bulging, almost touching dorsally; appearance fairly distinctive among NE longhorns. Attracted to lights.

Tessaropa tenuipes (Haldeman) [Fig. 174]

Flight Period: April-May, EUS

Larval Feeding Habits: small dead branches, various hardwoods incl. oak, hickory, walnut, beech. **Size**: 4-6 mm. **Notes**: This small, dark, uncommon species may be distinguished from other longhorns with short elytra by shape of prothorax, long antennae with first segment much broader than others, short tarsi, and completely divided eyes. The only NE species with which it might be confused is *Methia pusilla*, which is much paler, with more bulging, undivided eyes and slightly longer elytra.

Tribe **Achrysonini**

Achryson surinamum (Linnaeus) [Fig. 134]

Flight Period: April-September, EUS

Larval Feeding Habits: numerous woody plants, mostly legumes (e.g., locust), also elm, hackberry. **Size**: 10-25 mm. **Notes**: pale, shining, and somewhat variable in appearance, but no other NE longhorns have similar elytral markings, though sometimes the thoracic markings resemble those of *Curius dentatus*. Attracted to light. Ranges south to Argentina.

Tribe **Graciliini**

Gracilia minuta (Fabricius) [Fig. 140]

Flight Period: May-July, ENA

Larval Feeding Habits: dead branches of numerous shrubs and hardwoods, incl. oak, beech, willow. **Size**: 4-6 mm. **Notes**: An introduced and well-established European species, its shape, size, and swollen femora in combination with the dull integument are distinctive.

Tribe **Torneutini**

Knulliana c. cincta (Drury) [Fig. 148]

Flight Period: March-September, ENA

Larval Feeding Habits: dry dead branches and limbs of hardwoods, incl. oak, hickory, willow. **Size**: 15-30 mm. **Notes**: The markings on the dull elytra may sometimes be absent (always so in the more yellowish southeastern subspecies *K. c. ochracea*), but there are no other NE longhorns of similar size and coloration that have strong spines on the femora, pronotum, and elytral apices. The scutellum is also much longer than broad, an unusual trait. The "Banded Hickory Borer" also ranges throughout Texas and Oklahoma. Some SE populations (including Missouri) may represent an unnamed subspecies, and *K. c. ochracea* may itself prove to be a separate species. Attracted to UV lights, fairly common.

Tribe **Hesperophanini**

Eburia haldemani LeConte [Fig. 147]

Flight Period: May-July, SCUS

Larval Feeding Habits: hardwoods, incl. hackberry [willow, elm?]. **Size**: 15-30 mm. **Notes**: This and the following species are unique among NE longhorns in the possession of several raised ivory spots on the elytra; *haldemani* is brownish, elytra with ivory spots quite small, basal pair of spots distinctly separated from one another, pubescence distinct.

Eburia quadrigeminata (Say) [Fig. 146]

Flight Period: April-September, EUS

Larval Feeding Habits: dry solid heartwood, numerous hardwoods. **Size**: 12-25 mm. **Notes**: more golden-orange than the preceding species, with a slightly narrower pronotum (with lateral spines and dorsal calli more protuberant), elytra with ivory spots generally larger (though rather variable in size), basal pair touching closely, body less visibly pubescent. The "Ivory-marked Beetle" is notorious for emerging from furniture and flooring after as many as 10-40 years. Attracted to bait traps, also UV lights.

Hesperophanes pubescens (Haldeman) [Fig. 137]
Flight Period: July-August, EUS
Larval Feeding Habits: ? **Size**: 15-22 mm. **Notes**: one of our more nondescript longhorns, which actually makes it fairly easy to recognize. The uniformly pale brown body lacks spines or any other prominent surface sculpture, and the pubescence is uniformly pale, with a slight patterning on the pronotum; only *Anelaphus moestus* might be confused with it, and that species has strong antennal spines, and is much darker. Rare species, captured at UV lights.

****Penichroa fasciata*** (Stephens) [Fig. 136]
Flight Period: June-August, EUS
Larval Feeding Habits: dead or decaying twigs [hickory]. **Size**: 7-14 mm. **Notes**: introduced species from southern Europe and Asia, possibly established but rare if so. The pale markings are variable in extent, and sometimes reduced to four spots (similar to the following species). The slender body, long antennae, and long thin hairs on elytra in combination with the markings are fairly distinctive.

Tylonotus bimaculatus Haldeman [Fig. 142]
Flight Period: May-August, ENA
Larval Feeding Habits: live or dying hardwoods, especially ash and privet. **Size**: 9-18 mm. **Notes**: markings rather distinctive; also, pronotal calli well-defined, femora relatively pale. The range of the "Ash and Privet Borer" extends across the South into Arizona. Attracted to UV lights.

Tylonotus masoni (Knull) [Fig. 141]
Flight Period: June-August, EUS
Larval Feeding Habits: ? **Size**: 8-10 mm. **Notes**: smaller than preceding species, elytra and legs uniformly brownish, pronotal calli poorly defined, head very short. Though nondescript in color, the pronotal shape and short head are relatively distinctive. Rare species, attracted to UV lights.

Zamodes obscurus LeConte [Fig. 138]
Flight Period: ?
Larval Feeding Habits: ? **Size**: 11 mm. **Notes**: known only from one specimen collected in Pennsylvania in the 1800s, possibly extinct. Sculpturing and pubescence distinctive; the elytra and pronotum have a layer of appressed hairs among which are scattered sparse, erect, very long hairs. The antennae are very hairy, the tubercles at the antennal base bulging, and the pronotum somewhat flattened dorsally with low, irregular calli. The legs are distinctly club-shaped, and yellowish, as is much of the body.

Tribe **Elaphidiini**

Aneflomorpha subpubescens (LeConte) [Fig. 163]
Flight Period: May-August, EUS
Larval Feeding Habits: live saplings of oak and chestnut, sometimes branches of larger trees. **Size**: 14-18 mm. **Notes**: This distinctive large, light brown species has the pronotum elongate, strongly punctate, and darker than the elytra. The "Oak Stem Borer" can be abundant and destructive at times. This is the only member of this speciose genus that occurs in the NE. Attracted to UV lights.

Anelaphus m. moestus (LeConte) [Fig. 139]
Flight Period: August, SCUS
Larval Feeding Habits: under bark and in sapwood of dead walnut branches, oak, hackberry, occasional shrubs. **Size**: 9-15 mm. **Notes**: uniformly brown, with spinier antennae, broader body, and more shining elytra than other NE *Anelaphus*. This relatively nondescript species cannot easily be confused with other NE longhorns. Known primarily from Texas, Arizona, and Mexico, but recorded from west-central Missouri.

Anelaphus parallelus (Newman) [Fig. 162a-b]
Flight Period: February-August, ENA
Larval Feeding Habits: live twig pruner of most eastern hardwoods and shrubs, esp. oak. **Size**: 8-20 mm. **Notes**: similar to *A. villosus*, distinguished by more slender body with pubescence more stripe-like, largely due to narrow glabrous lines; *parallelus* also has the lateral pubescent lines on the pronotum much less frequently interrupted and the last male sternite is more truncate. In both species, the pronotum of the male is slightly broader and more granulate than in the female. Recently, the name "Oak Twig Pruner" has been applied to this species, where it was originally (inappropriately) applied to *villosus*. Common, attracted to UV lights.

Anelaphus pumilus (Newman) [Fig. 160]
Flight Period: March-July, ENA
Larval Feeding Habits: oak, hickory, chestnut, elm, linden. **Size**: 8-10 mm. **Notes**: small, elongate, elytra mottled, with long scattered hairs. The absence of spines at elytral tips and reduced antennal spines readily distinguish this from the somewhat similar *A. parallelus* and *A. villosus*. Attracted to UV lights.

Anelaphus villosus (Fabricius) [Fig. 161a-b]
Flight Period: April-September, ENA
Larval Feeding Habits: live twig pruner of most eastern hardwoods and shrubs, esp. hickory. **Size**: 12-20 mm. **Notes**: The "Twig Pruner" has historically been confused with *A. parallelus* (which is more reliably associated with oaks, and has been responsible for many of the reports of damage), from which it is distinguished by typically broader body, which is often also slightly more reddish, and sparser, more mottled pubescence, which is more evenly distributed. The last male sternite is more rounded. Also occurs in Arizona. Common, attracted to UV lights.

Elaphidion mucronatum (Say) [Fig. 155]
Flight Period: April-October, ENA
Larval Feeding Habits: under bark and in sapwood of most eastern hardwoods and shrubs. **Size**: 13-20 mm. **Notes**: The "Spined Bark Borer" has very long femoral spines, which readily distinguish it from *Parelaphidion* species, a longer spine on 3rd antennal segment, and has slightly denser elytral pubescence. A very common species, attracted to UV lights, bait traps.

Enaphalodes atomarius (Drury) [Fig. 150]
Flight Period: May-October, E & SUS
Larval Feeding Habits: beneath bark of dead hardwood trees or stumps, incl. oak,

hickory. **Size**: 20-30 mm. **Notes**: distinguished from following species by very strong, deep punctures of elytral humeri, less complete coverage of elytral pubescence, last abdominal sternite of male squared-off, that of female notched forming two small lobes (see illustration on p. 5). Attracted to UV lights, bait traps; fairly common, range also extends across south to Arizona.

Enaphalodes cortiphagus (Craighead) [Fig. 151]

Flight Period: July-September, NEUS

Larval Feeding Habits: in thick bark of living mature oak. **Size**: 20-30 mm. **Notes**: The "Oak-bark Scarrer" is not nearly as common as preceding species and has an apparently disjunct population in Arizona, but it is very similar in general appearance and difficult to distinguish; it has much weaker humeral punctation, often obscured by grayish pubescence; last abdominal sternite of male rounded, that of female only slightly concave at tip. Attracted to UV lights.

Enaphalodes hispicornis (Linnaeus) [Fig. 149]

Flight Period: May-October, US

Larval Feeding Habits: oaks. **Size**: 25-40 mm. **Notes**: large and relatively nondescript aside from pronotal sculpture (posterior-central ridge in female, and narrow lateral longitudinal impressions in male), but the spinose antennae and elytra, which are always uniformly pubescent, make this species distinctive. Attracted to UV lights. Range includes all of US and into Mexico.

Enaphalodes rufulus (Haldeman) [Fig. 152]

Flight Period: May-October, ENA

Larval Feeding Habits: living oaks, sometimes maple. **Size**: 15-28 mm. **Notes**: differs from other species by having integument reddish-brown, hairs golden and rather dense. The "Red Oak Borer" is sometimes abundant enough to seriously damage or kill large trees. Attracted to UV lights.

Micranoplium unicolor (Haldeman) [Fig. 159]

Flight Period: May-July, EUS

Larval Feeding Habits: ? **Size**: 7-9 mm. **Notes**: small, slender, with uniform elytral and pronotal pubescence, no spines at elytral tips, somewhat resembling *Anelaphus*. Though somewhat nondescript, no other NE longhorns are genuinely similar. Attracted to UV lights.

Parelaphidion aspersum (Haldeman) [Fig. 153a-b]

Flight Period: June-October, ENA

Larval Feeding Habits: outer bark of oak, hickory. **Size**: 14-21 mm. **Notes**: antennae and elytra with spines, pronotum with large glabrous areas, especially midline. Very similar to and slightly larger than *P. incertum*, best distinguished by the longer antennal segments; 4th segment longer than scape, total length almost equal to (in female) or clearly exceeding body length (in male). Females of these species are difficult to separate, as are museum specimens whose antennae are not intact and straight. Attracted to UV lights, bait traps.

Parelaphidion incertum (Newman) [Fig. 154a-b]

Flight Period: April-September, EUS

Larval Feeding Habits: outer bark of living mulberry. **Size**: 8-15 mm. **Notes**: The "Mulberry Bark Borer" is very similar to *P. aspersum*, but generally smaller, distinguished by shorter antennal segments; not reaching apical third of elytra (in female) or roughly equal to body length (in male). So far as is known, these species do not feed on each other's host plants. Attracted to UV lights.

Psyrassa pertenuis (Casey) [Fig. 164]

Flight Period: June-July, Atlantic Coast

Larval Feeding Habits: various hardwoods; hickory, magnolia, cherry. **Size**: 7-12 mm. **Notes**: slender species with shining, weakly punctate pronotum, similar to *P. unicolor*, differing most noticeably in longer spine on 3rd antennal segment (spine alone is twice the length of the 2nd antennal segment) and more slender pronotum. Some range overlap but largely replaces *unicolor* in SE.

Psyrassa unicolor (Randall) [Fig. 165]

Flight Period: May-August, EUS

Larval Feeding Habits: girdle twigs of numerous hardwoods, esp. oak, hickory, beech. **Size**: 7-13 mm. **Notes**: slightly shorter pronotum, much shorter spine on 3rd antennal segment, and hairs on elytra denser and shorter than in *P. pertenuis*. The "Branch Pruner" is attracted to UV lights and is fairly common.

Stenosphenus notatus (Olivier) [Fig. 156]

Flight Period: March-September, ENA

Larval Feeding Habits: dead limbs of hickory, sometimes hackberry. **Size**: 9-16 mm. **Notes**: Red pronotum with black pronotal spot (sometimes almost absent) and especially the shining black elytra with short white hairs make this species distinctive.

Tribe **Ibidionini**

Heterachthes ebenus Newman [Fig. 166]

Flight Period: April-August, ENA

Larval Feeding Habits: dead pine branches. **Size**: 6-12 mm. **Notes**: The combination of dull, dark, unmarked body and slender elongate shape makes this species distinctive. Males of this and following species have the basal antennal flagellomeres shining and thickened, which is also very distinctive.

Heterachthes pallidus Haldeman [Fig. 167]

Flight Period: May-August, E & CNA

Larval Feeding Habits: hickory, sometimes tuliptree. **Size**: 7-12 mm. **Notes**: shining, with variable coloration; reddish with pale markings, or entirely pale. Slightly resembles *Psyrassa* species, but has unspined antennae and elytra, and wrinkled pronotum. Attracted to UV lights.

Tribe **Curiini**

Curius dentatus Newman [Fig. 135]

Flight Period: May-July, SEUS

Larval Feeding Habits: beneath bark of small branches, both conifers and hardwoods. **Size**: 5-7 mm. **Notes**: small species with very distinctive markings (sometimes reduced on elytra), small tooth on underside of all femora. Uncommon, ranges along Atlantic coast to Maryland and the Mississippi River drainage to southern Illinois.

Tribe **Obriini**

Obrium maculatum (Olivier) [Fig. 169]

Flight Period: April-October, E & SNA

Larval Feeding Habits: numerous hardwoods and shrubs, incl. oak, hickory. **Size**: 4-7 mm. **Notes**: pronotum strongly constricted at base and bulging anteriorly, elytra with distinctive brown markings. Attracted to UV lights.

Obrium rubidum LeConte [Fig. 168]

Flight Period: May, ENA

Larval Feeding Habits: ? **Size**: 9-11 mm. **Notes**: largest and darkest of three species in NE; distinctive shape, with dullish, punctate pronotum, shining reddish elytra. Uncommon.

Obrium rufulum Gahan [Fig. 170]

Flight Period: May-August, ENA

Larval Feeding Habits: dead dry ash branches, sometimes linden, oak. **Size**: 5-8 mm. **Notes**: uniformly pale, shining; pronotum with lateral tubercles; shape distinctive. Attracted to UV lights.

Tribe **Molorchini**

Molorchus b. bimaculatus Say [Fig. 176]

Flight Period: March-July, ENA

Larval Feeding Habits: mines beneath bark of dead branches of numerous hardwoods (esp. maple, but also including hosts used by other subspecies). **Size**: 5-8 mm. **Notes**: head and thorax black, elytra very short with dark tips, femora strongly clubbed. Adults common on flowers. Split into many subspecies of questionable validity, and definitely in need of more detailed study to resolve this.

Molorchus bimaculatus celti Knull [Fig. 177]

Flight Period: ?, NEUS

Larval Feeding Habits: mines in sapwood of dead hackberry and redbud. **Size**: 8-12 mm. **Notes**: larger than nominate subspecies, pronotum and antennae more elongated. Extremely hard to separate except for largest specimens.

Molorchus bimaculatus corni Haldeman [Fig. 178]

Flight Period: April-August, C & SEUS

Larval Feeding Habits: mines in dogwood. **Size**: 5-7 mm. **Notes**: similar to nominate subspecies, but with red prothorax, elytra often dark. Adults found on dogwood flowers. Primarily SE subspecies, recorded from east-central Missouri. Another southern subspecies, *M. bimaculatus semiustus* (Newman) is distinguished by having head, thorax, and elytra reddish.

Tribe **Stenopterini**

Callimoxys s. sanguinicollis (Olivier) [Fig. 179]

Flight Period: April-July, ENA

Larval Feeding Habits: hickory, but also reportedly mines in New Jersey Tea (*Ceanothus*) and relatives. **Size**: 7-12 mm. **Notes**: distinctive tapering club-shaped elytra and slender clubbed legs; pronotum black in males, usually red in females. Adults commonly found on *Ceanothus* flowers.

Tribe **Callichromatini**

Plinthocoelium s. suaveolens (Linnaeus) [Fig. 219a-b]

Flight Period: May-September, C & SEUS

Larval Feeding Habits: trunk and root borers of tupelos and mulberry. **Size**: 25-40 mm. **Notes**: attractive and distinctive large metallic species, varying from green to blue or bronze, often with hints of other colors. Legs, however, always with red femora. Basically SE distribution, but extends up into Delaware in East and Missouri in West. Attracted to UV lights, bait traps.

Tribe **Dryobiini**

Dryobius sexnotatus Linsley [Fig. 103]

Flight Period: March-September, NENA

Larval Feeding Habits: maple, elm, beech, linden. **Size**: 18-25 mm. **Notes**: attractive, uncommon, and distinctive species, with pubescent antennae and large bright yellow spots on elytra.

Tribe **Callidiini**

Callidium a. antennatum Newman [Fig. 216a-b]

Flight Period: April-July, Atlantic Coast

Larval Feeding Habits: under bark of recently dead or dying pines, rarely spruce. **Size**: 9-15 mm. **Notes**: The dull elytra and pronotum with distinct granulate lateral zone in male (sinuate posteriorly) and completely roughened in female make this species the most distinctive of the NE members of the genus. Disjunct populations near eastern edge of Rockies.

Callidium frigidum Casey [Fig. 218a-b]

Flight Period: April-June, NENA

Larval Feeding Habits: under bark of juniper and cedar. **Size**: 6-10 mm. **Notes**: This species is shining, typically green-tinted (if bluish, it can be difficult to separate from *C. texanum*), but also recognizable by pronotal punctures widely spaced in middle, and distinct punctures often visible in lateral areas (where other species are simply roughened and granulate laterally); epipleural margins of elytra curled under but typically splayed out apically.

Callidium schotti Schaeffer [Fig. 214]

Flight Period: March-July, NENA

Larval Feeding Habits: under pine bark (also cedar?). **Size**: 9-15 mm. **Notes**: pronotal punctures distinct in middle but almost no space between them, elytra irregularly punctate and dull. This rare species can be difficult to distinguish from *C. texanum*; the duller elytral surface is probably the most reliable feature, as the difference in pronotal punctation is fairly subtle. Also, *schotti* has an impunctate scutellum, slightly splayed elytral tips, and different hosts. Females might be confused with *C. antennatum*, but the pronotum is not uniformly rough, and the elytral punctures are irregular.

Callidium texanum Schaeffer [Fig. 215a-b]

Flight Period: May-July, EUS

Larval Feeding Habits: under juniper bark. **Size**: 8-13 mm. **Notes**: pronotal punctures crowded, but with some shining space in between, elytra slightly shining but deeply punctate, parallel-sided rather than splayed out apically. Fairly common; some of the preceding species may be easily confused with it. Range covers all but Pacific Coast.

Callidium violaceum (Linnaeus) [Fig. 217a-b]

Flight Period: May-August, NENA

Larval Feeding Habits: under bark of dry conifers (pine, larch, spruce). **Size**: 9-15 mm. **Notes**: As the name implies, this species is usually more violet in color than blue; fairly easy to distinguish from other species by three small dorsal pronotal calli in females (surface otherwise irregularly roughened; if calli absent, this is only species with rough pronotum combined with shining elytra), males with "V"-shaped basal callus, very coarsely punctate and shining elytra, punctures fairly well-separated. Also Eurasian, believed to be introduced into North America.

Hylotrupes bajulus (Linnaeus) [Fig. 145a-b]

Flight Period: June-August, C & ENA

Larval Feeding Habits: bores in dry conifers. **Size**: 8-20 mm. **Notes**: Hairy pronotum with two prominent lateral calli and small pubescent spots on elytra make this species distinctive despite somewhat variable size and coloration (some individuals are rather pale, especially elytra). The "Old House Borer" attacks structural conifer wood and occurs throughout Europe, Asia, and Africa.

Meriellum proteus (Kirby) [Fig. 220]

Flight Period: June-July, NNA

Larval Feeding Habits: mines beneath bark of dead spruce and pine. **Size**: 10-16 mm. **Notes**: Broad smooth median area of pronotum and yellow stripes on elytra (sometimes reduced) make this species distinctive, also yellowish femora in contrast to dark body.

Phymatodes aereus (Newman) [Fig. 193]

Flight Period: April-July, ENA

Larval Feeding Habits: under bark of dead oak and chestnut. **Size**: 6-12 mm. **Notes**: Like other members of this genus, *aereus* is small, slightly flattened with soft elytra and swollen femora, but distinguished from others by combination of uniform brown body color, yellowish legs, and strongly punctate elytra.

Phymatodes amoenus (Say) [Fig. 189]

Flight Period: April-August, ENA

Larval Feeding Habits: mine in dead grapevines. **Size**: 5-7 mm. **Notes**: body entirely pale reddish, elytra metallic blue, fairly easily confused with *P. lengi* (see p. 118), but pronotum more rounded, body and legs slightly shorter and thicker, abdomen paler, 2nd antennal segment longer. Of these, perhaps the easiest to see is the paler abdomen, which is the same color as the rest of the body, where it is clearly darker in *lengi*.

Phymatodes ater LeConte [Fig. 194]

Flight Period: May-July, NENA

Larval Feeding Habits: oak. **Size**: 5-7 mm. **Notes**: This very uncommon species has three pronotal calli, dark, somewhat shining body and strongly punctate elytra, sometimes (but not always) with oblique pale bands at base or tip. The dark, shining, punctate elytra without markings are distinctive; those with markings can be told from *P. varius* by the oblique band orientation rather than transverse, and the pronotal calli.

Continued on page 118

PLATE 1: Figures 1-11

1. ***Parandra b. brunnea*** (Fabricius), a = male, b = female [p. 25] “Pole Borer”
Size: 8-20 mm. **Notes**: tarsi with 5 visible segments, no process between tarsal claws. Eyes emarginate. Robust form, resembling a stag beetle, but antennae not clubbed.

2. ***Parandra polita*** Say, a = male, b = female [p. 25]
Size: 10-25 mm. **Notes**: tarsi with 5 visible segments, paired bristles arising from small process between tarsal claws. Oval, entire eyes. More elongate form than preceding.

3. ***Scaphinus muticus*** (Fabricius) [p. 28]
Size: 12-20 mm. **Notes**: unusual in appearance; brownish color, dull sculpture, short antennae and prothorax widest at middle. Resembles a dung beetle, but antennae not clubbed.

4. ***Spondylis upiformis*** Mannerheim [p. 28]
Size: 8-20 mm. **Notes**: shape and structure unique; body shiny, black, prothorax widest towards front.

5. ***Archodontes m. melanopus*** (Linnaeus), female [p. 26] “Live-oak Root Borer”
Size: 30-57 mm. **Notes**: pronotum convex, slightly tapering anteriorly, and with surface sculpture generally smoother than following species. Also with rounded tubercles at antennal bases, mandibles directed more ventrally, not hairy in males.

6. ***Stenodontes d. dasytomus*** (Say), a = female, b = male [p. 26] “Hardwood Stump Borer”
Size: 20-50 mm. **Notes**: pronotum somewhat flatter and more parallel-sided than preceding, with pronotal surface roughened in places. Tubercles at antennal bases somewhat angulate and projecting, mandibles directed forward and often hairy in males.

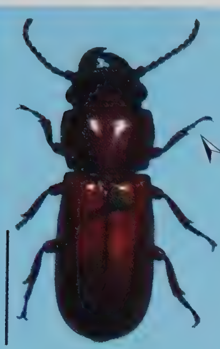
7. ***Tragosoma depsarius*** (Linnaeus), male [p. 27] “Hairy Pine Borer”
Size: 15-40 mm. **Notes**: elytra finely ridged. Pronotum hairy, with a single lateral spine, antennae slender.

8. ***Orthosoma brunneum*** (Forster), a = female, b = male [p. 26] “Brown Prionid”
Size: 25-50 mm. **Notes**: 11-segmented antennae are slender, never flattened. Elongate, weakly ridged elytra.

9. ***Prionus laticollis*** (Drury), a = male, b = female [p. 27] “Broad-necked Root Borer”
Size: 20-50 mm. **Notes**: antennae with 12-13 segments. Darker than following species, base of pronotum wider, elytra more wrinkled than punctate, eyes widely spaced, female metasternum hairless.

10. ***Prionus pocularis*** Dalmeister, male [p. 27]
Size: 25-45 mm. **Notes**: antennae with 12-13 segments as in preceding, but body usually paler, base of pronotum narrower, elytra more punctate, eyes closely spaced, female metasternum hairy.

11. ***Prionus debilis*** Casey, a = male, b = female [p. 26]
Size: 20-40 mm. **Notes**: antennae 15-18 segments. Paler and more reddish than *P. imbricornis* (Fig. 12), male antennal punctures larger and more widely spaced.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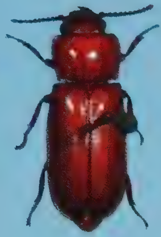
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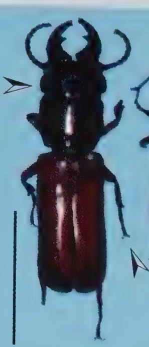
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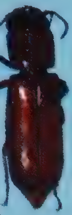
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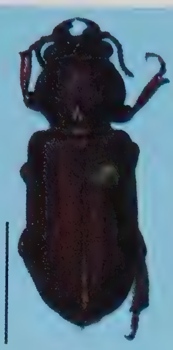
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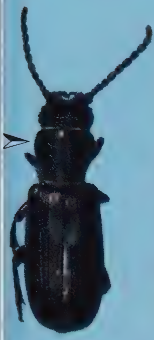
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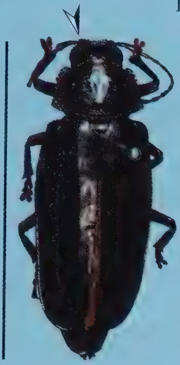
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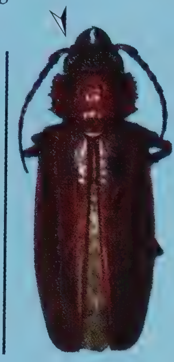
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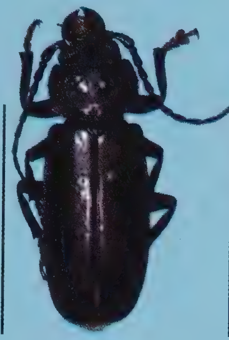
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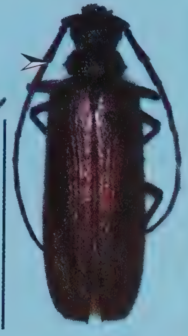
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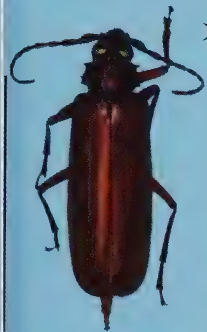
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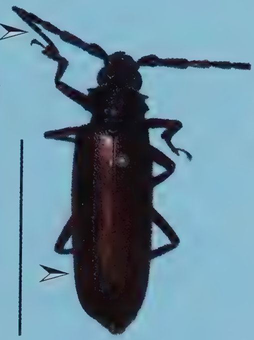
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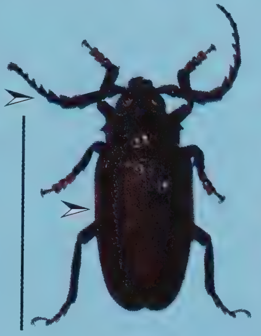
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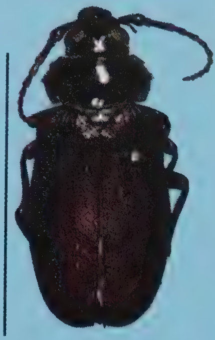
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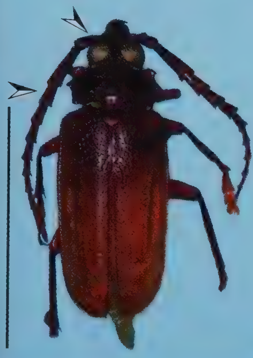
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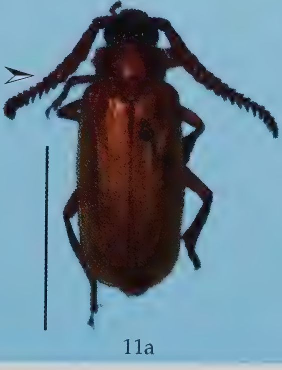
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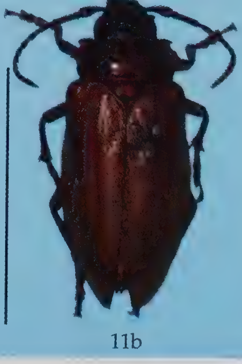
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PLATE 2: Figures 12-25

12. ***Prionus imbricornis*** (Linnaeus) [p. 27] "Tile-horned Prionus"
Size: 25-50 mm. **Notes**: antennae with 15-18 segments as in *P. debilis*, but generally larger, darker brown to black, male antennal punctures smaller and closer spaced.

13. ***Prionus fissicornis*** Haldeman [p. 27]
Size: 25-40 mm. **Notes**: relatively small and pale, antennae with 25-30 segments make this species quite distinctive.

14. ***Sphenostethus taslei*** (Buquet), a = female, b = male [p. 27]
Size: 20-30 mm. **Notes**: distinctive among NE prionines, and the multi-toothed elytral tips distinguish it from anything else similar in other subfamilies; pronotum untoothed, elytra typically black, smooth and shining aside from punctation.

15. ***Arhopalus rusticus obsoletus*** (Randall) [p. 43]
Size: 15-25 mm. **Notes**: eyes hairy, pronotal surface smoother than the following species, with shallow depressions, elytra duller with weak ridges.

16. ***Arhopalus foveicollis*** (Haldeman) [p. 43]
Size: 14-30 mm. **Notes**: eyes not hairy; pronotal surface irregular, with a pair of deep pits; elytra with distinct ridges.

17. ***Asemum striatum*** (Linnaeus) [p. 44]
Size: 10-18 mm. **Notes**: apical antennal segments shorter than in following species, elytra dull, striate, generally dark but light-colored variants occur. Eyes not completely divided as in *Tetropium*.

18. ***Asemum australe*** LeConte [p. 44]
Size: 11-16 mm. **Notes**: close to preceding species, but apical antennal segments longer, elytra slightly shinier and smoother.

19. ***Tetropium schwarzianum*** Casey [p. 44]
Size: 11-15 mm. **Notes**: difficult to distinguish from *T. cinnamopterum*, but pronotum with pubescence and distinct punctures relatively dense, surface fairly shiny underneath pubescence.

20. ***Tetropium velutinum*** LeConte [p. 44]
Size: 10-20 mm. **Notes**: somewhat similar to *T. schwarzianum*, but pronotum distinctively dull and granulate with only fine pubescence. Elytra vary from brown (as shown) to black.

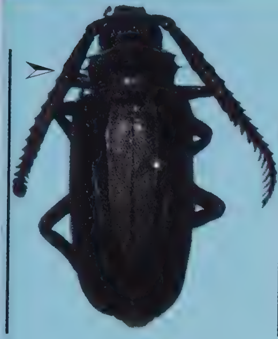
21. ***Tetropium cinnamopterum*** Kirby [p. 44] "Eastern Larch Borer"
Size: 8-15 mm. **Notes**: pronotum shining, with small, well-spaced punctures and weak pubescence, elytra typically reddish. Difficult to separate from the following species, but in addition to the preceding features, the lower eye lobes are roughly twice the size of the upper lobes.

22. ***Tetropium parvulum*** Casey [p. 44]
Size: 8-14 mm. **Notes**: distinguished with some difficulty from preceding species by a much more sparsely punctate pronotum, especially anteriorly, elytra typically more brownish, and lower eye lobes much less than twice the size of upper lobes.

23. ***Sachalinobia r. rugipennis*** (Newman) [p. 37]
Size: 10-16 mm. **Notes**: reticulate elytral sculpturing unique and unmistakable.

24. ***Rhagium inquisitor*** (Linnaeus) [p. 37] "Ribbed Pine Borer"
Size: 9-21 mm. **Notes**: variable in both coloration and size, but nonetheless quite distinctive from all other NA longhorns in shape, sculpturing, and antennae.

25. ***Anthophylax attenuatus*** (Haldeman) [p. 30]
Size: 12-17 mm. **Notes**: pronotum with 2 elongate calli, strong lateral spines; elytra with pubescence creating a mottled brown appearance, unique in NE lepturines. Males may have elytra more yellow, pronotum darker.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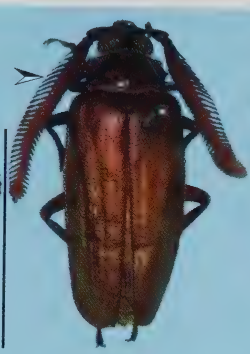
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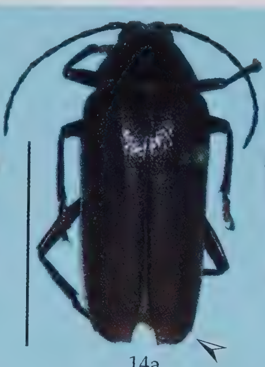
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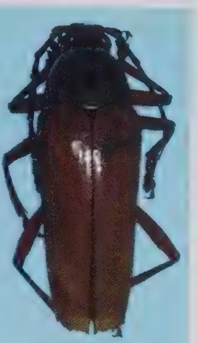
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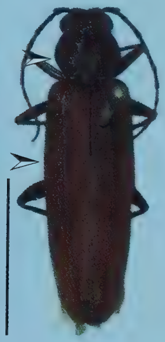
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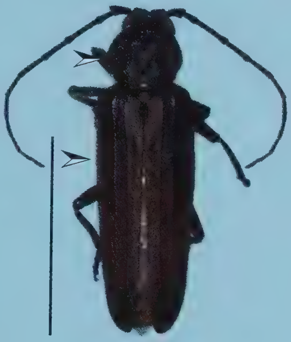
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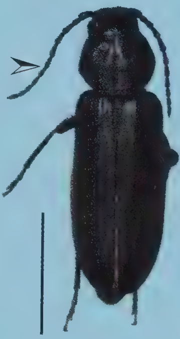
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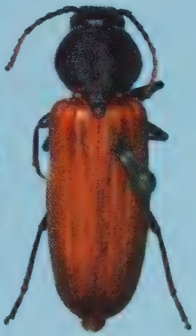
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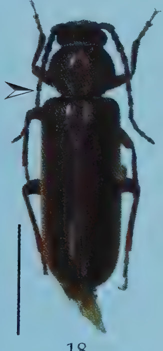
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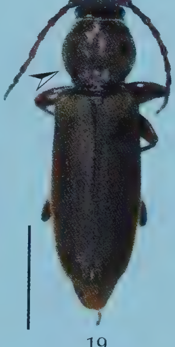
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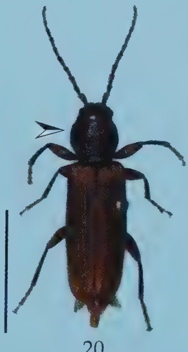
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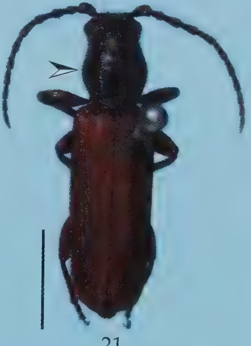
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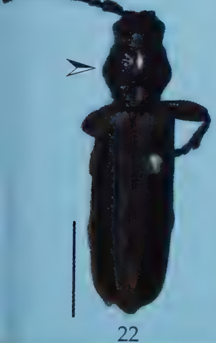
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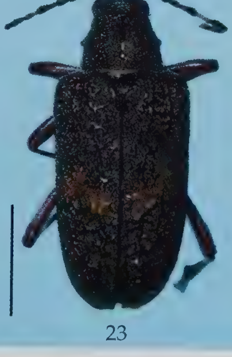
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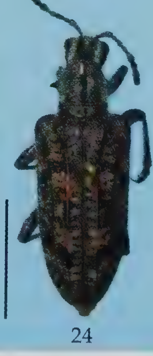
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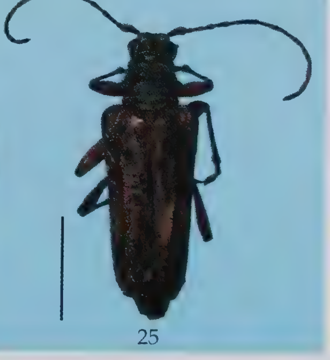
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PLATE 3: Figures 26-35

26. ***Anthophylax viridis*** LeConte [p. 30]
Size: 12-17 mm. **Notes**: resembling following species, but pronotum somewhat duller and more finely punctate, legs black, and elytra with weak longitudinal ridges.

27. ***Anthophylax cyaneus*** (Haldeman) [p. 30]
Size: 11-16 mm. **Notes**: distinguished from preceding species by metallic, coarsely punctate pronotum and elytra, and legs mostly pale.

28. ***Pseudogaurotina abdominalis*** (Bland) [p. 37]
Size: 9-16 mm. **Notes**: strongly resembles a less robust form of the following species, but has the elytra more distinctly punctate, pronotum more constricted at base, and a normal mesosternum.

29. ***Gaurotes cyanipennis*** (Say) [p. 32]
Size: 9-13 mm. **Notes**: This robust, metallic blue-green species with yellow legs can be readily recognized by the smooth elytra, gradually tapering pronotum, and strongly bulging mesosternum (protruding in front of middle coxae).

30. ***Centrodera quadrimaculatus*** (Champlain & Knull) [p. 31]
Size: 16-18 mm. **Notes**: strongly punctate pronotum, yellowish elytra each with two black spots (one dorsal, one subhumeral). At certain angles, the elytra appear almost golden.

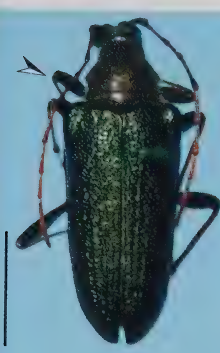
31. ***Brachysomida bivittata*** (Say) [p. 31]
Size: 7-11 mm. **Notes**: extremely variable punctation and coloration; most commonly the pronotum is orange with dark spots, but can vary from all orange to all black; sometimes the midline and margins of the pronotum are densely punctate, with appressed hairs; the elytra can be either orange with black stripes or all black, but occasionally may be black with very narrow yellow margins, and may sometimes be fairly pubescent; the legs may be orange or black. These features can occur in virtually any combination, as shown. Nonetheless, the general appearance of this species is different from all other NE longhorns with the possible exception of the following species.

32. ***Gaurotes thoracica*** (Haldeman) [p. 32]
Size: 9-10 mm. **Notes**: resembles a dark form of the preceding species, but can be easily distinguished by the pronotum, which is punctate and pubescent *except* along the midline and margins. The elytra are slightly more metallic greenish-tinted, as well, and always have dark lateral margins, and the legs are generally dark with reddish tibial bases, but sometimes the femora are also reddish. The underside is always dark, often with a reddish metepisternum.

33. ***Stenocorus cylindricollis*** (Say) [p. 38]
Size: 12-22 mm. **Notes**: somewhat variable in color, though head and thorax often darker than elytra; recognizable by outer tips of elytra produced into points, and very short basal antennal segments (especially third).

34. ***Stenocorus schaumii*** (LeConte), a = female, b = male [p. 38]
Size: 17-30 mm. **Notes**: pronotum shining, usually orange, with strong lateral projections; elytra black, wrinkled, and dull.

35. ***Stenocorus cinnamopterus*** (Randall), a = male, b = female [p. 37-38]
Size: 10-16 mm. **Notes**: uniformly brownish, with small but distinct lateral pronotal tubercles, and rounded elytral apices. Females are somewhat more densely clothed with golden pubescence than males.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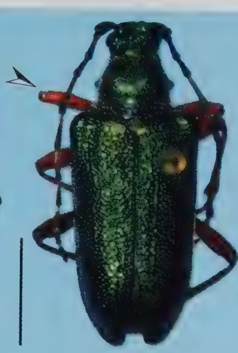
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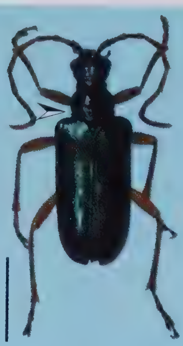
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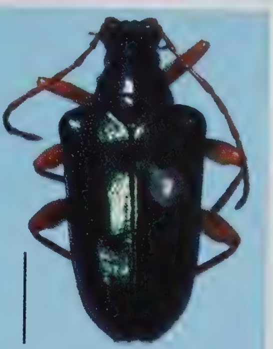
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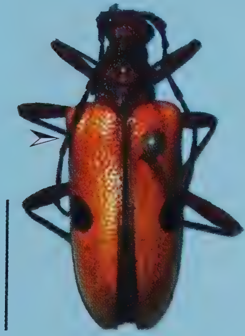
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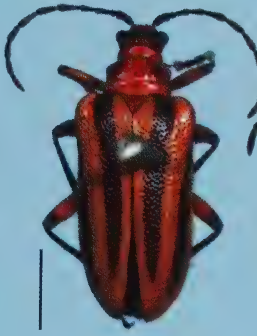
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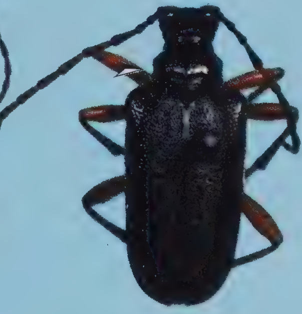
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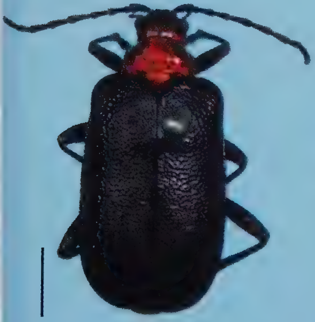
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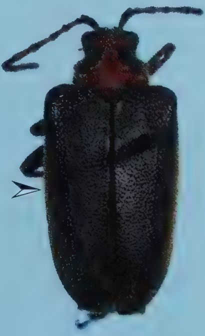
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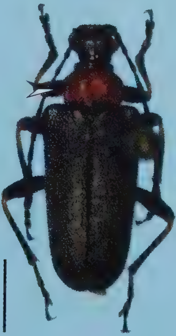
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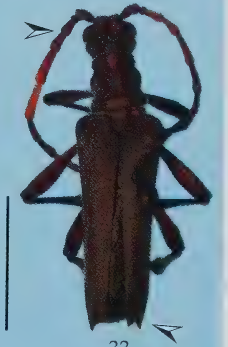
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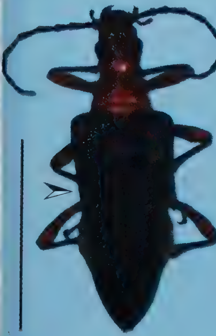
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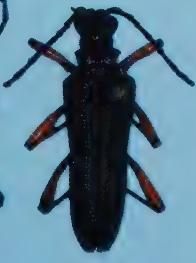
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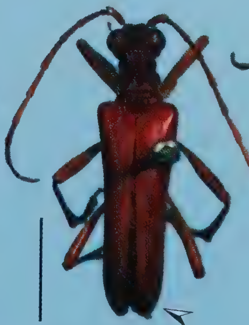
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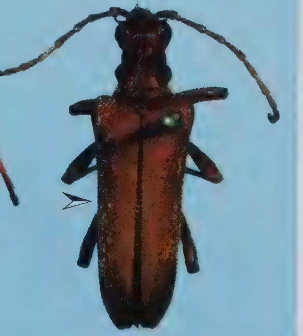
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PLATE 4: Figures 36-51

36. ***Stenocorus vittiger*** (Randall) [p. 38]
Size: 12-20 mm. **Notes**: elytra somewhat shining, with pale stripes on black background, little pubescence, antennae relatively long and slender.

37. ***Stenocorus trivittatus*** (Say) [p. 38]
Size: 12-16 mm. **Notes**: elytra with distinctive coloration: reddish at sides, with thin black stripes bordering median yellow stripes.

38. ***Leptorhabdium pictum*** (Haldeman) [p. 35]
Size: 9-17 mm. **Notes**: a pale, slender species somewhat similar to *Centrodera*, but with very distinctive coloration.

39. ***Centrodera decolorata*** (Harris) [p. 31]
Size: 19-30 mm. **Notes**: pronotum polished, with strong lateral tubercles, elytra unicolored, not pubescent.

40. ***Distenia undata*** (Fabricius) [p. 25]
Size: 16-25 mm. **Notes**: the clusters of long hairs on underside of antennae, strong pronotal calli and lateral projections, distinctive body shape and pattern of markings make this species easily recognizable.

41. ***Centrodera sublineata*** LeConte [p. 31-32]
Size: 11-15 mm. **Notes**: slender shape and appearance distinctive; pronotum pubescent, elytra pubescent with long bare stripes.

42. ***Encyclops caerulea*** (Say) [p. 32] "Oak Bark Scaler"
Size: 7-11 mm. **Notes**: a slender metallic species with yellow legs; pronotal shape and surface sculpturing are distinctive.

43. ***Idiopidonia pedalis*** (LeConte) [p. 34]
Size: 8-11 mm. **Notes**: The dull, pubescent pronotum with narrow shining midline, and elongate, almost parallel-sided body separate this species from genera such as *Pidonia* and *Strangalepta*.

44. ***Strangalepta pubera*** (Say) [p. 38]
Size: 8-12 mm. **Notes**: distinguished from preceding species by more elongate, shining pronotum. Resembles the all-black form of *S. abbreviata* but pronotum and elytra more strongly punctate, pubescence longer, and the body much less elongate.

45. ***Typocerus lugubris*** (Say) [p. 41]
Size: 8-12 mm. **Notes**: solid black except for a tiny pale spot laterally on epipleural area; also, the pronotum has no erect hairs as in other *Typocerus*, only weak, pale apical and basal hair bands, and the elytra also lack erect hairs.

46. ***Pseudostrangalia cruentata*** (Haldeman) [p. 37]
Size: 8-12 mm. **Notes**: The shining pronotum with sharp corners and the elytra with red margins and pointed tips are distinctive; might be mistaken for a small *Typocerus* but lacks dense hair bands on the pronotum, and the antennae are not serrated.

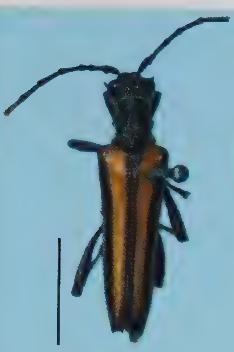
47. ***Alosternida chalybaea*** (Haldeman) [p. 29]
Size: 5-8 mm. **Notes**: dark metallic violet-blue elytra distinctive among NE lepturines, shape of head and prothorax distinguish it from similar members of other subfamilies.

48. ***Grammoptera subargentata*** (Kirby) [p. 33-34]
Size: 5-8 mm. **Notes**: body and pronotum always black, though legs, antennal bases, and sometimes clypeus may occasionally be partially reddish. Separated from following three species by entirely dark, shining elytral pubescence, and pronotal pubescence dark or somewhat silvery, never golden. The pronotum is slightly more elongate and with more distinct punctures than in *G. haematites*, and lacks a medial depression; the hairs along the midline all point straight backwards.

49. ***Grammoptera ruficeps*** (LeConte) [p. 33]
Size: 5-8 mm. **Notes**: very similar to the preceding species, but the head is largely or entirely red, body and pronotum always black, the legs and antennal bases reddish. The pubescence of the elytra and pronotum is fairly dense and entirely pale golden.

50. ***Grammoptera exigua*** (Newman) [p. 33]
Size: 4-7 mm. **Notes**: pronotum slightly less elongate than the other species in the genus, typically orange with black central spot, with very fine, roughened punctation, and the females have a small tubercle on the last abdominal sternite. Rare individuals with a fully black prothorax can best be distinguished by the pronotal shape and punctation, as well as the female sternite.

51. ***Grammoptera haematites*** (Newman) [p. 33]
Size: 4-7 mm. **Notes**: pronotum typically entirely reddish, more elongated than in preceding species, and with coarser punctation. The head is black except for the clypeus, and the basal antennal segments and legs are mostly reddish. Occasional individuals can also be found with a black prothorax, and these can be recognized by the faintly impressed medial line of the pronotum, which has outward-directed hairs, and further separated from *subargentata* by the pale elytral hairs.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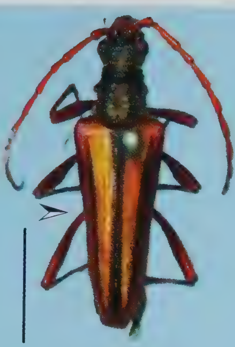
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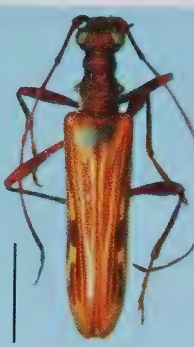
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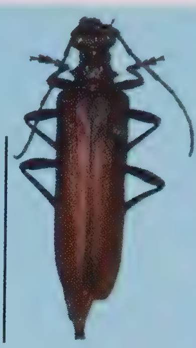
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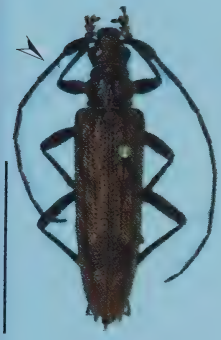
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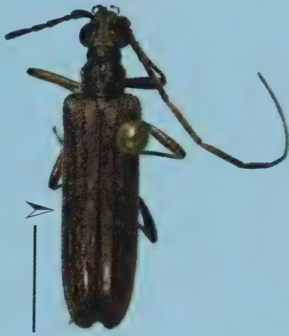
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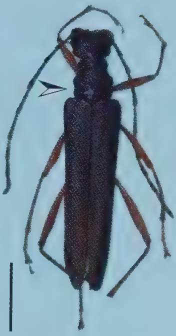
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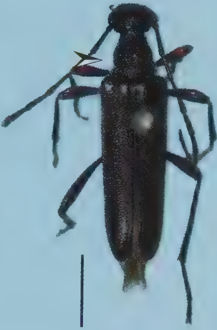
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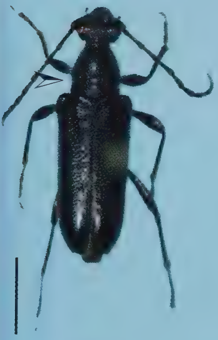
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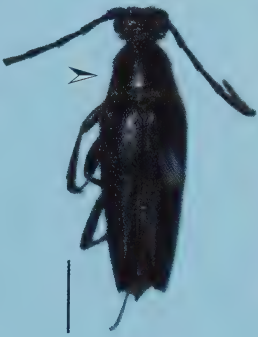
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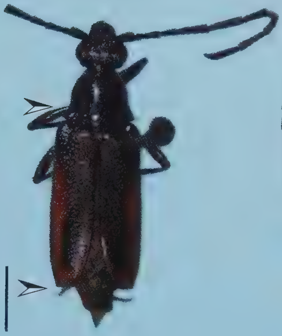
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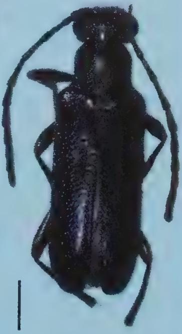
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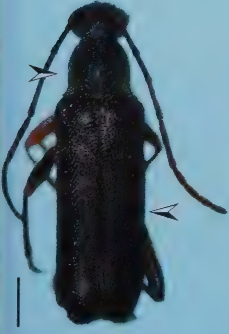
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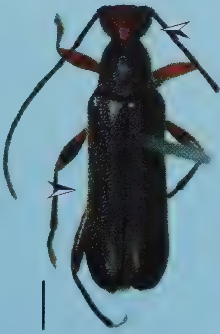
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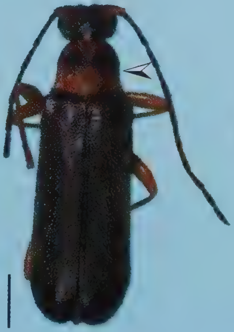
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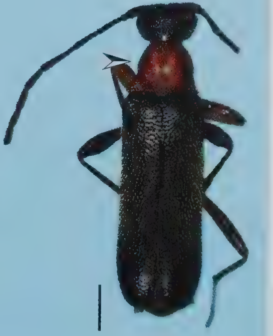
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PLATE 5: Figures 52-61

52. ***Neoalosterna capitata*** (Newman) [p. 36]
Size: 8-10 mm. **Notes**: resembles the following species, but has a much weaker impression across the pronotal base, as well as shinier, more sparsely punctate, and more tapering elytra.

53. ***Charisalia americana*** (Haldeman), a = male, b = female [p. 32]
Size: 8-11 mm. **Notes**: pronotum with sharp projecting corners; resembles the preceding, but is distinguished by the strong lateral impressions at base of pronotum, very dull, more densely punctate elytra, and broadened elytral tips.

54. ***Strangalia bicolor*** (Swederus) [p. 39]
Size: 11-15 mm. **Notes**: distinctive appearance; antennae, head, and prothorax always yellowish-orange, elytra dark.

55. ***Strangalia sexnotata*** Haldeman, a = male, b = female [p. 39]
Size: 8-13 mm. **Notes**: distinguishable from other *Strangalia* by its less elongate form, relatively bristly elytral pubescence, and strong elytral spots; color form that extends into Missouri has first few antennal segments black, and light legs, elytra with six discrete spots, while the coastal form recorded from Virginia has more completely darkened appendages.

56. ***Strangalia luteicornis*** (Fabricius) [p. 39]
Size: 9-14 mm. **Notes**: somewhat resembles *S. famelica*, but antennae and much of body pale, generally yellow, and elytral spots more well-developed, though slightly variable.

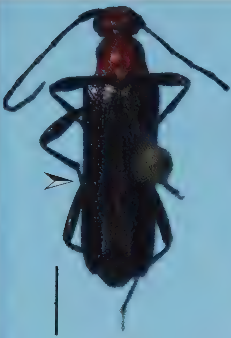
57. ***Strangalia famelica*** Newman, a & c = male, b = female [p. 39]
Size: 10-17 mm. **Notes**: antennae black, elytra variable, but generally with at least two pairs of dark spots, at middle and near tip, with abdominal tip greatly expanded in male, female abdomen usually reddish.

58. ***Strangalia solitaria*** Haldeman, a & c = male, b = female [p. 39]
Size: 10-17 mm. **Notes**: similar to the preceding, but lacking or almost lacking spots in middle of elytra, and pronotum sometimes all pale; in males, abdominal tip not greatly expanded, in females, abdomen usually black. Some individuals may have an all-dark pronotum and almost unmarked elytra, resembling *S. acuminata*, but the light legs will separate them.

59. ***Leptura subhamata*** Randall, a = male, b = female [p. 36]
Size: 11-17 mm. **Notes**: pronotum relatively slender, elytra distinctively patterned; extent of black varies from small median markings and thin margins to thick margins surrounding small pale areas, as shown.

60. ***Bellamira scalaris*** (Say), a & b = male, c = female [p. 30]
Size: 17-26 mm. **Notes**: distinctive large species, with short head and pronounced "neck," body and elytra bottle-shaped and variably marked with light pubescence, male with expanded abdominal tip.

61. ***Leptura emarginata*** Fabricius [p. 35]
Size: 25-35 mm. **Notes**: This large, bright scarlet and black species with serrate antennae is distinctive among NE longhorns.



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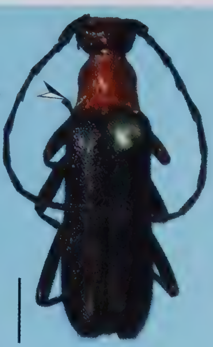

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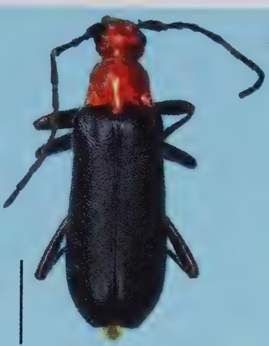

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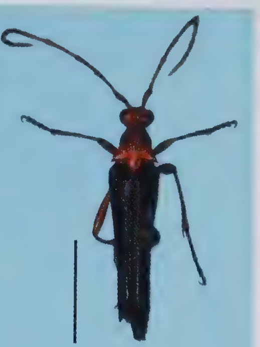

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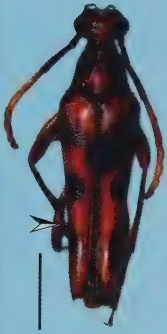

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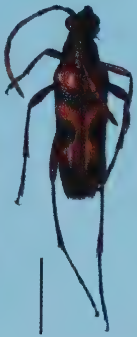

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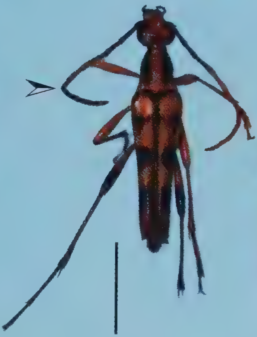

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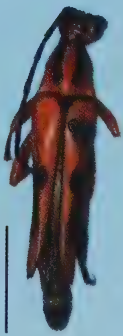

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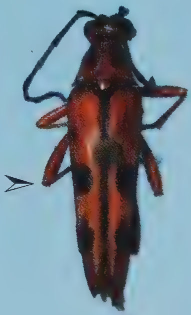

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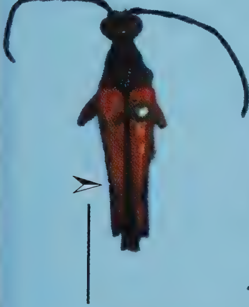

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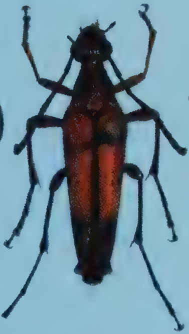

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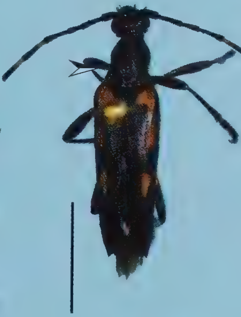

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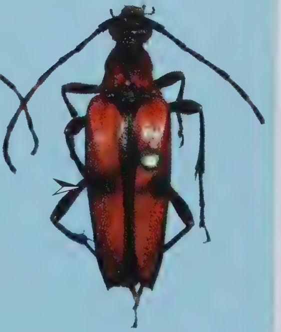

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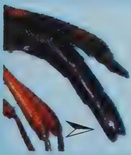

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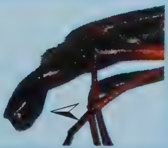

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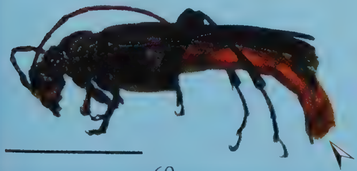

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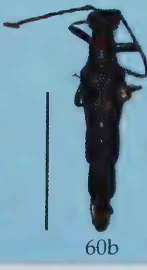

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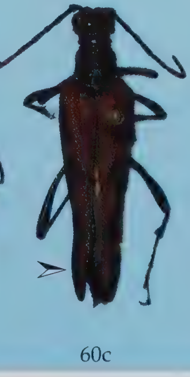

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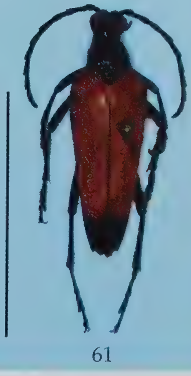

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PLATE 6: Figures 62-71

62. ***Strangalia acuminata*** (Olivier) [p. 39]
Size: 8-12 mm. **Notes**: distinguished from other *Strangalia* by antennae, head and prothorax always black, elytra varying from largely brownish with black edges to all black in more southern populations.

63. ***Leptura abdominalis*** (Haldeman), a & c = male, b = female [p. 35]
Size: 12-18 mm. **Notes**: This robust species is variably colored, with almost entirely orange individuals, others entirely black, and many different intermediate combinations. The pronotum most commonly has two black spots, which sometimes fuse, and the elytra are often black with orange stripes. The all-black individuals can be separated from all-black *L. plebeja* by the banded antennae and sharp-spined, strongly divergent elytral tips.

64. ***Leptura obliterata deleta*** (LeConte) [p. 35]
Size: 11-16 mm. **Notes**: distinguished from other *Leptura* by strong, dense pronotal punctures, and elytral markings limited to poorly defined medial and subapical spots (reminiscent of *Strangalia famelica*, though the more robust body and the pronotum with sinuate basal margin with a strong median crease easily distinguish this and other *Leptura* from members of other genera).

65. ***Leptura plebeja*** Randall [p. 35]
Size: 9-14 mm. **Notes**: two color forms, one with pale brownish elytra, the other all black; the all-black form is best distinguished from all-black *L. abdominalis* by the darker antennae and weakly spined, less divergent elytral tips.

66. ***Pygoleptura n. nigrella*** (Say), a = female, b = male [p. 37]
Size: 11-23 mm. **Notes**: The shape and sculpturing of this species are unmistakable, and somewhat intermediate between a *Leptura* and *Stictoleptura*; the pronotum is somewhat squarish, punctate with a strong transverse basal crease, and the head is short with a broad neck and slightly serrate antennae. The elytra are usually brownish-red, occasionally entirely black, and weakly punctate.

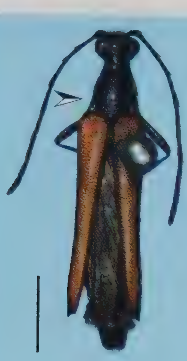
67. ***Stictoleptura c. canadensis*** (Olivier), a = male, b = female [p. 38]
Size: 10-15 mm. **Notes**: elytra usually black with a red base, but occasionally entirely red; the alternating colors on the serrated antennae (rarely all black), pronotal form, and strong punctation are quite distinctive among NE longhorns.

68. ***Brachyleptura rubrica*** (Say) [p. 31]
Size: 12-18 mm. **Notes**: pronotum somewhat angled rather than smoothly tapered anteriorly, elytra uniformly reddish-orange with sparse, strong punctures. Somewhat similar to the preceding, but with the antennae unserrated and banded differently.

69. ***Brachyleptura vagans*** (Olivier), male [p. 31]
Size: 8-12 mm. **Notes**: greatly resembles *B. champlaini*, but the color forms do not exactly match that species; light markings in *vagans* most commonly are only basal spots, though sometimes even these are absent (Fig. 69b), and other individuals have the elytral suture darkened with extensive pale areas (in *champlaini*, the elytra are either completely pale or have only a narrow pale lateral band as shown). The thoracic punctation is not as dense as in *champlaini* (the spaces between punctures are visibly greater than the diameter of the punctures themselves), and males have the hind tibiae bowed, flattened, and irregularly-shaped (polished on inner side; Fig. 69b).

70. ***Brachyleptura champlaini*** Casey, a = male, b = female [p. 30]
Size: 8-12 mm. **Notes**: This species has two color forms: elytra generally entirely reddish or brownish, but sometimes dark with long pale lateral stripes (as shown). Very similar to *B. vagans*, but males have slender, straight hind tibiae and are thus easily separated; females, however, can be quite difficult to separate aside from subtle color features (see synopses), but have slightly denser thoracic punctation, with the spaces between punctures not much greater than the diameter of the punctures themselves.

71. ***Brachyleptura circumdata*** (Olivier) [p. 30]
Size: 7-10 mm. **Notes**: typically smaller and paler than other species in genus, colored similarly to *Gnathacmaeops pratensis*, but the strongly tapering pronotal shape and strong neck are distinctive. Easily separated from the lightest individuals of *B. vagans* and *B. champlaini* by the much less divergent elytral tips, which are also darkened.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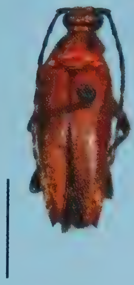
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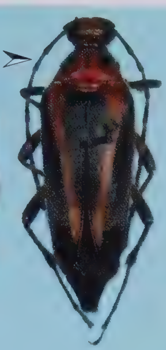
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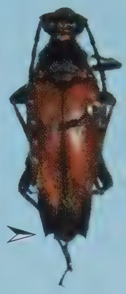
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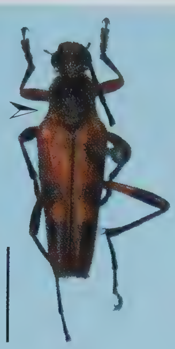
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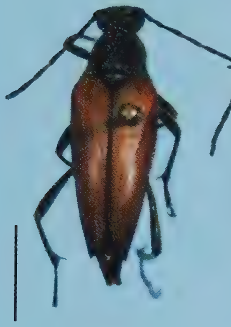
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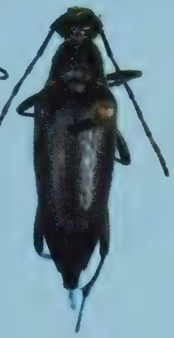
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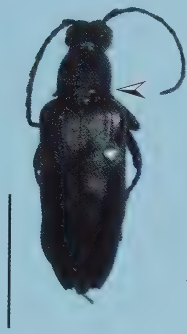
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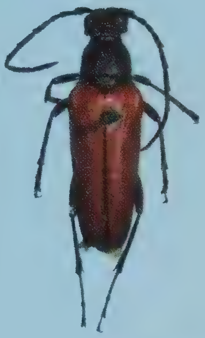
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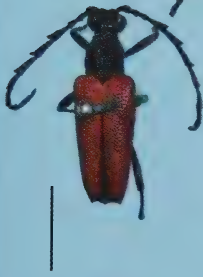
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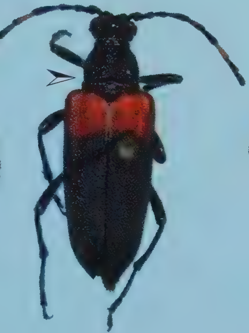
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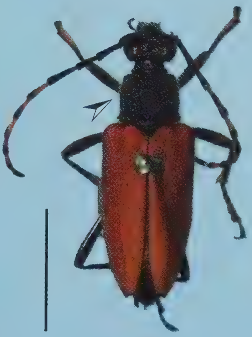
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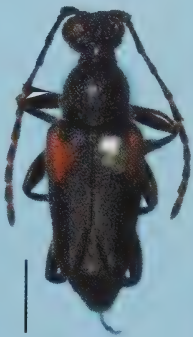
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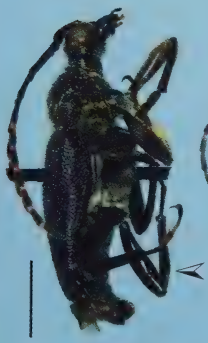
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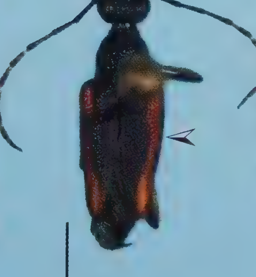
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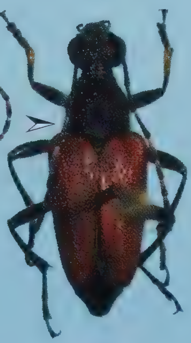
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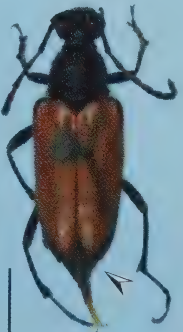
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PLATE 7: Figures 72-82

72. ***Gnathacmaeops pratensis*** (Laicharting) [p. 32-33]
Size: 5-9 mm. **Notes**: This short-bodied, dark species with pale elytra is somewhat similar in appearance to both *Acmaeops proteus* and *Brachyleptura circumdata*, but the dorsal surface of the pronotum is smoothly rounded, and the head is very elongate with entire eyes, and not constricted to form a neck.

73. ***Acmaeops p. proteus*** (Kirby) [p. 29]
Size: 7-11 mm. **Notes**: elytra shining, coloration variable, from pale (often with black stripes) to all black, pronotal tubercles dorsal with a median dividing impression. The wedge-like pronotal structure is probably the most distinctive feature.

74. ***Acmaeops discoideus*** (Haldeman) [p. 29]
Size: 6-9 mm. **Notes**: sculpture and coloration distinctive; base of pronotum developed into broad tubercles projecting laterally, elytra dull black with orange at base and sometimes along margins.

75. ***Acmaeopsoides rufula*** (Haldeman) [p. 29]
Size: 8-10 mm. **Notes**: resembles members of preceding genus, but has the eyes notched, and only very weak basal swellings on the pronotum. The pronotum is somewhat angled laterally, with shining appressed pubescence, and the elytra are rather uniformly reddish-brown.

76. ***Trachysida aspera brevifrons*** (Howden) [p. 40]
Size: 8-16 mm. **Notes**: this and the following distinguished from similar members of other genera by the smoothly granulate surface and truncated cone shape of the pronotum, plus the rounded outer elytral tips. In both species of *Trachysida*, there are two color forms, one all-black, and the other black with light brownish elytra. In *aspera brevifrons*, however, the elytral surface is always entirely opaque between the punctures, which are somewhat crowded at the midline towards the base.

77. ***Trachysida mutabilis*** (Newman), a = male, b = female [p. 40]
Size: 8-15 mm. **Notes**: similar to the preceding species, but either color form of *mutabilis* can be separated by the visibly shining elytral surface (especially basally) between more uniformly spaced punctures.

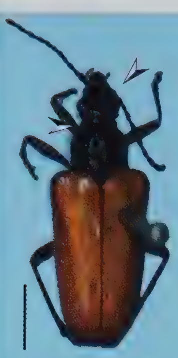
78. ***Anastrangalia sanguinea*** (LeConte) [p. 29]
Size: 7-13 mm. **Notes**: easily recognized by its long, almost cylindrical pronotum and short head. The brownish elytra each have two very fine longitudinal ridges.

79. ***Trigonarthris atrata*** (LeConte) [p. 40]
Size: 13-18 mm. **Notes**: best separated from the following two species by having a more weakly pubescent pronotum with more widely spaced punctation, and a relatively deep median depression; also, the elytral coloration tends to be slightly more reddish-orange, and the body slightly broader. It is further separated from *T. minnesotana* by having epipleural margin more weakly convex (as in *T. proxima*). The male has the last sternite notched, but not as deeply as in *proxima*, and the females may or may not have a weak ridge on the pygidium. See synopses for details.

80. ***Trigonarthris minnesotana*** (Casey), a = female, b-c = male [p. 40]
Size: 13-18 mm. **Notes**: In this species, the epipleural margin is strongly convex, the last male sternite lacks a notch, and the female lacks a ridge on the pygidium. The legs and underside also tend to be more densely clothed with shining golden pubescence (the underlying punctation is about twice as dense on the sternites). See synopses for details.

81. ***Trigonarthris proxima*** (Say), a = female, b-d = male [p. 40-41]
Size: 13-20 mm. **Notes**: The last male sternite has a very elongate triangular notch, and the female has a corresponding strong ridge on the pygidium, which apparently fits into the male notch during mating (an external “lock-and-key” structure). The pronotum is quite pubescent, with crowded punctures and a relatively shallow median depression. The legs and underside are less visibly clothed with golden pubescence than in *T. minnesotana*, and the epipleural margin is not as strongly convex.

82. ***Lepturopsis biforis*** (Newman) [p. 36]
Size: 12-16 mm. **Notes**: The well-defined midline and basal grooves in pronotum and the brownish elytra with small black lateral spots make this species distinctive.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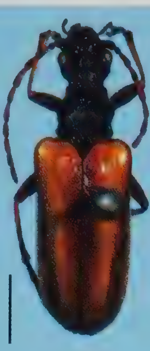
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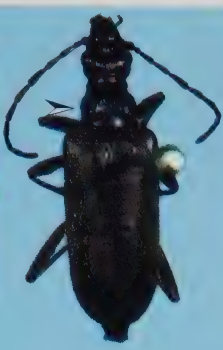
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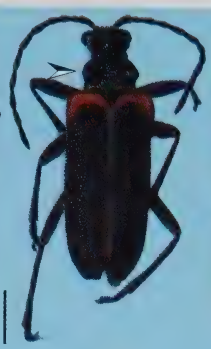
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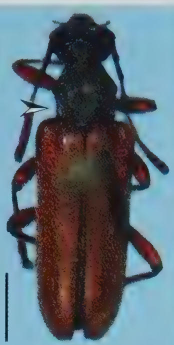
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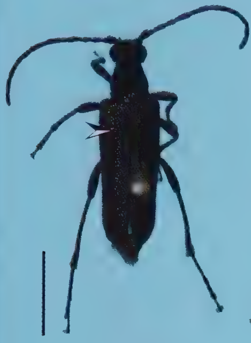
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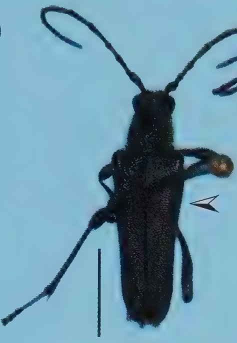
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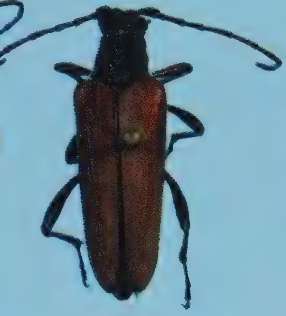
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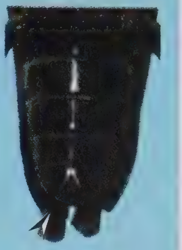
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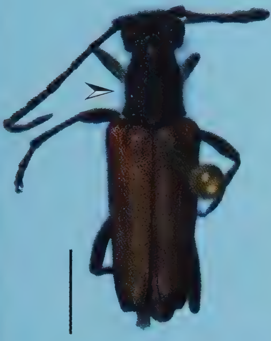
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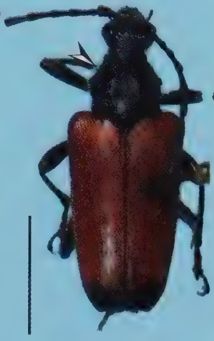
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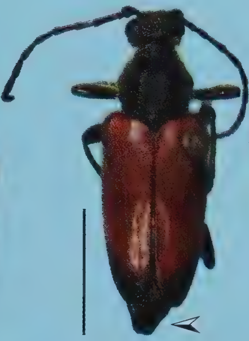
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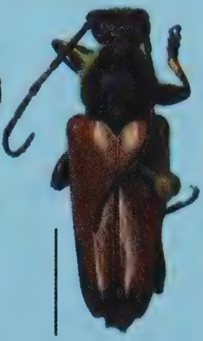
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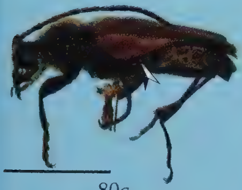
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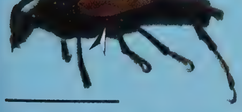
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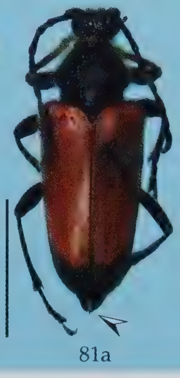
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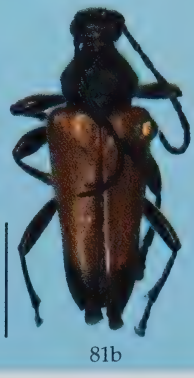
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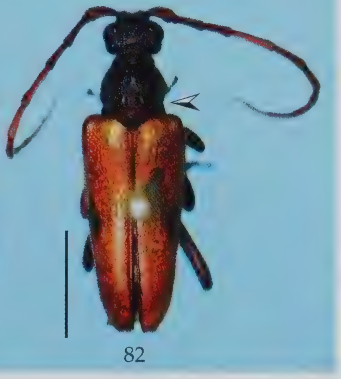
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PLATE 8: Figures 83-93

83. ***Xestoleptura tibialis*** (LeConte), a = male, b = female [p. 43]
Size: 9-16 mm. **Notes**: The base of each elytron has a small lobe that fits into a corresponding arch in the basal margin of the pronotum. This species has a very dull pronotal surface and the elytra are largely light brownish, with black areas somewhat variable in size, especially at apex, where they may fuse (thus somewhat resembling *Leptura obliterata deleta*; Fig. 64).

84. ***Judolia instabilis*** (Haldeman), a = female, b = male [p. 34]
Size: 6-15 mm. **Notes**: Females can be separated from *J. cordifera* by the sparser, shorter elytral pubescence (arising from coarser punctures), the broader, more rounded elytral tips (though apically divergent), and the generally strong black markings at the basal third of the elytra, often forming a complete or narrowly broken band. Occasional specimens are almost entirely black, but with the area lateral to the humerus pale. The final male tergite is essentially unmodified, and the hind tibial tubercles are smaller than in *cordifera*.

85. ***Judolia cordifera*** (Olivier) [p. 34]
Size: 8-12 mm. **Notes**: Females of this species can be separated from *J. instabilis* by the denser, longer elytral pubescence (arising from fine, dense punctures), the narrower, pointed elytral tips, and the relatively weak black markings at the basal third of the elytra (typically reduced to only a lateral spot). The hairs of the pronotum are also slightly hooked at the tips, a feature not seen in *instabilis*. Males can be easily recognized by a strong medio-basal protuberance and apical concavity on the final sternite, and the hind tibiae are lined ventrally with distinct, irregular tubercles.

86. ***Judolia quadrata*** (LeConte), a = female, b = male [p. 35]
Size: 7-10 mm. **Notes**: elytra much less tapering than in preceding two species, tips less divergent than in *J. instabilis*. Further distinguished by the extremely short, fine pronotal pubescence (especially visible in males), and the absence of ventral tubercles on the male hind tibiae. The antennae of both sexes are much shorter than in *J. montivagans*. Occasional specimens have the elytra mostly dark with several small pale markings laterally, as shown.

87. ***Evodinus m. monticola*** (Randall) [p. 32]
Size: 8-13 mm. **Notes**: The basally constricted pronotum with dense golden hairs, and very pale elytra with black markings make this species quite distinctive, though the markings are somewhat variable in extent.

88. ***Judolia m. montivagans*** (Couper), a = male, b = female [p. 34]
Size: 7-12 mm. **Notes**: with relatively long and slender antennae, otherwise similar to *J. quadrata*; elytra not strongly tapering, and very weakly pubescent, pale areas typically cream-colored, though variable in extent (as shown) and irregular in shape. Males lack tubercles on the hind tibiae.

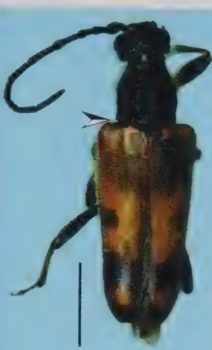
89. ***Pachyta lamed liturata*** Kirby, a = male, b = female [p. 36]
Size: 11-21 mm. **Notes**: robust, hairy species, elytra typically reddish with vague black markings, though sometimes all black, but pronotal shape quite distinctive.

90. ***Typocerus l. lunulatus*** (Swederus) [p. 41-42]
Size: 8-12 mm. **Notes**: elytra black, each with two discrete basal yellow spots.

91. ***Typocerus lunulatus texanus*** Linsley & Chemsak [p. 42]
Size: 8-12 mm. **Notes**: elytra with more yellow than nominate subspecies; basal spots fused almost completely, often with small apical marks.

92. ***Typocerus sparsus*** LeConte [p. 42]
Size: 7-10 mm. **Notes**: This black and yellow-marked species with orange legs resembles a small version of *T. zebra*, but the basal yellow elytral markings are not triangular, and the pronotum is also distinctive; there are only weak, pale basal and apical hair bands, and the surface is otherwise coarsely punctate with sparse, suberect hairs.

93. ***Typocerus zebra*** (Olivier) [p. 42-43]
Size: 10-16 mm. **Notes**: elytral markings quite uniform and distinctive, particularly the small triangular basal yellow marks; additionally, the pronotum is coarsely punctate, lacks the layer of appressed pubescence seen in other species (though fine, erect hairs are still present), and is bordered on all four sides by dense golden hair bands.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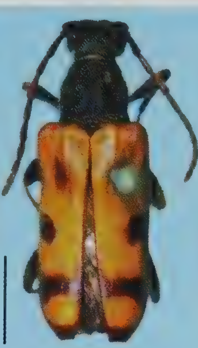
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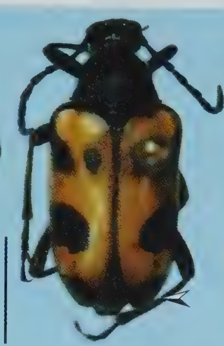
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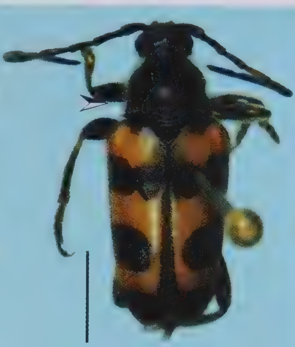
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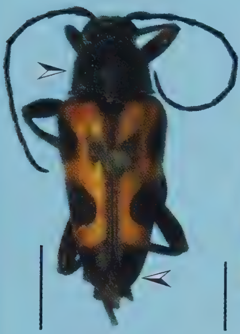
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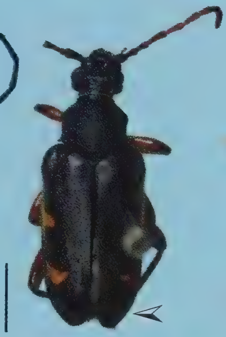
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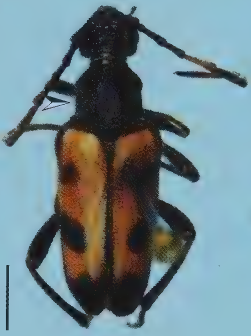
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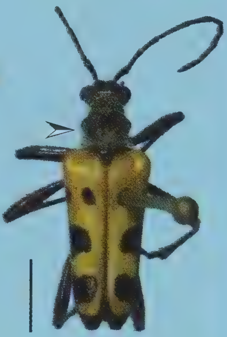
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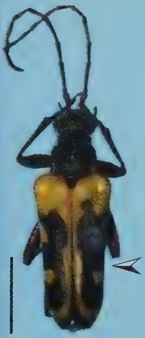
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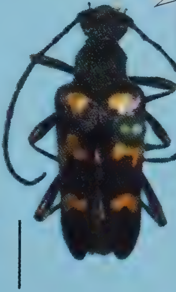
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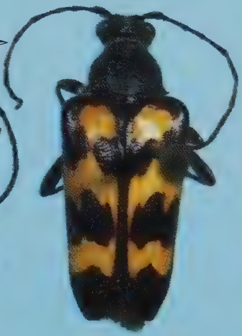
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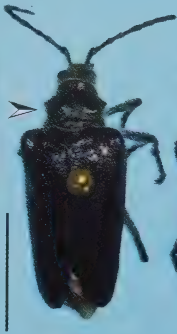
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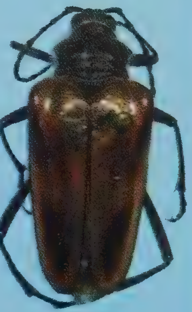
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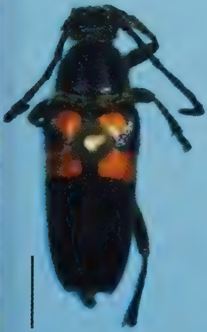
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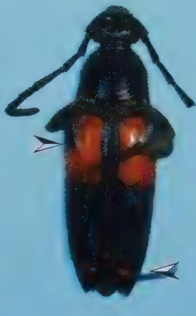
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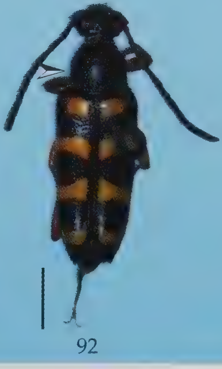
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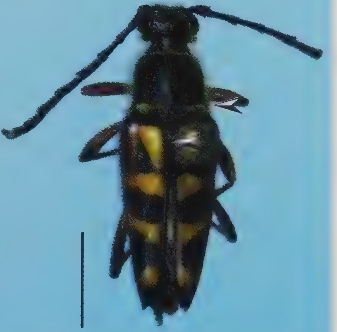
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PLATE 9: Figures 94-105

94. ***Xestoleptura octonotata*** (Say) [p. 43]
Size: 11-14 mm. **Notes**: combination of markings and body shape quite distinctive; elytra dark with four yellow spots of various sizes (rarely joining in middle), body somewhat elongate, and largely shining.

95. ***Typocerus sinuatus*** (Newman) [p. 42]
Size: 9-14 mm. **Notes**: the elytral markings are much more clearly defined and less variable than in the very similar *T. octonotatus*, and the complete transverse dark band at base (sometimes also at middle) also is distinctive.

96. ***Typocerus octonotatus*** (Haldeman) [p. 42]
Size: 10-15 mm. **Notes**: variable in appearance; the yellow markings may be quite reduced, though the pattern is fairly distinctive, even so, aside from well-marked specimens of *T. confluens*. The small depression on the last male sternite and smaller swelling on the female pygidium will permit separation from that species. All forms of this and *confluens* may be easily separated from *T. velutinus* by the erect pronotal hairs.

97. ***Typocerus confluens*** Casey, a = female, b = male [p. 41]
Size: 11-15 mm. **Notes**: quite variable in color, elytral ground color varying from reddish to black, and with yellow markings generally small (medial markings often connected along suture, as shown), sometimes almost absent. Difficult to distinguish from *T. octonotatus*; however, the last male abdominal sternite is very deeply concave at tip, while the female pygidium has a pronounced pubescent swelling.

98. ***Typocerus v. velutinus*** (Olivier), a & c = male, b = female [p. 42]
Size: 9-16 mm. **Notes**: variable in color, mostly in the extent of the yellow markings (never connected along the suture). The pronotum is densely covered with appressed golden pubescence, and the basal and apical hair bands are strong and complete.

99. ***Typocerus a. acuticauda*** Casey [p. 41]
Size: 9-14 mm. **Notes**: somewhat variable in color, usually reddish with small yellow markings, though these may be slightly larger or absent altogether; possible to confuse with weakly-marked individuals of *T. velutinus*, but the pronotum has an unusual layer of slightly curled hairs below a set of very erect hairs with a very fine glabrous midline, and elytral tips coming to a single strong point.

100. ***Typocerus deceptus*** Knull [p. 41]
Size: 11-17 mm. **Notes**: rather similar to *T. velutinus*, with the yellow markings small and unconnected along suture, but distinctive in having a broad interruption in the middle of the basal pronotal hair band, no apical pronotal hair band, and the tips of the elytra are rather abruptly and strongly tapered (i.e., the lateral elytral margin is strongly sinuate).

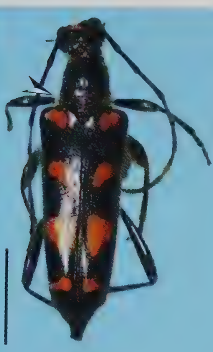
101. ***Strophiona nitens*** (Forster) [p. 39-40] "Chestnut Bark Borer"
Size: 10-15 mm. **Notes**: distinctive among NE longhorns; slightly resembles some *Typocerus*, but pronotum strongly constricted towards base, more rounded at corners, and pubescence metallic yellow.

102. ***Cosmosalia chrysocoma*** (Kirby) [p. 32]
Size: 10-20 mm. **Notes**: The very dense, appressed, metallic golden elytral pubescence is quite distinctive.

103. ***Dryobius sexnotatus*** Linsley [p. 52]
Size: 18-25 mm. **Notes**: attractive and distinctive species, with pubescent antennae and large bright yellow spots on elytra.

104. ***Neoclytus a. acuminatus*** (Fabricius) [p. 121] "Red-headed Ash Borer"
Size: 4-13 mm. **Notes**: distinctively marked, with antennae thickened at tips.

105. ***Calloides n. nobilis*** (Harris) [p. 120]
Size: 18-25 mm. **Notes**: large species, often with distinctive yellow markings, but even unmarked individuals cannot be mistaken easily for any other NE longhorns, with the round, smooth pronotum and unspined antennae.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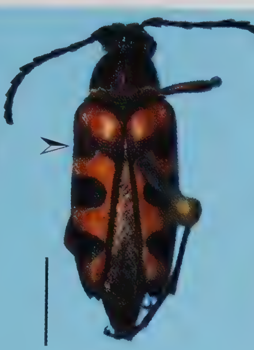
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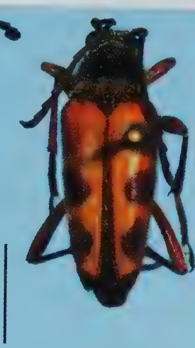
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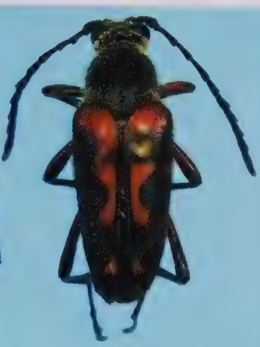
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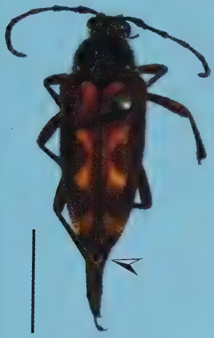
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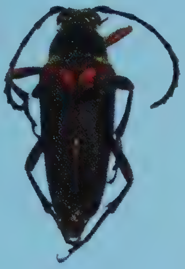
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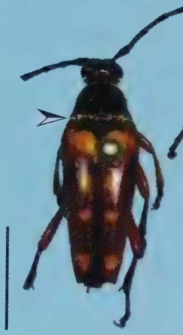
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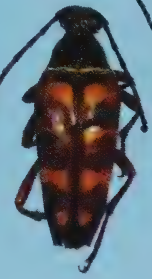
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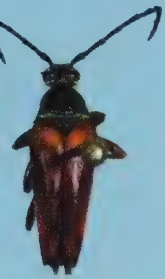
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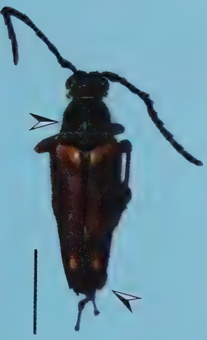
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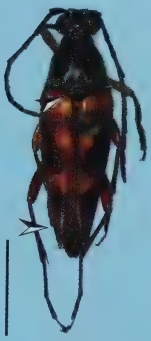
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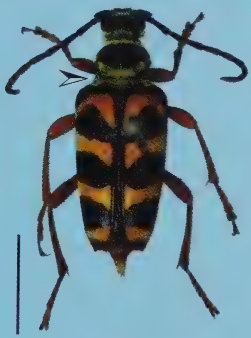
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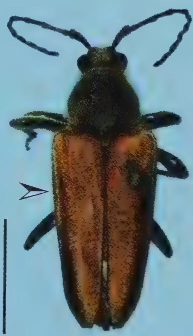
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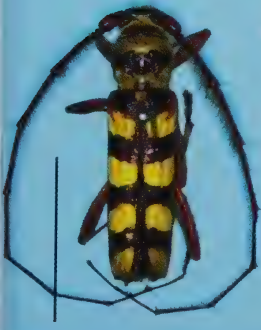
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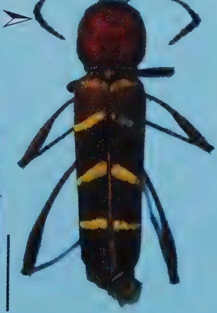
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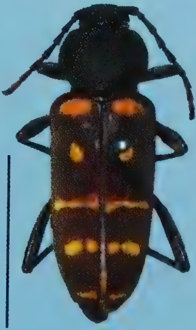
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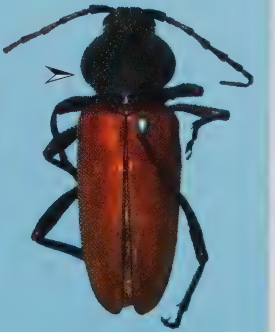
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PLATE 10: Figures 106-116

106. ***Megacyllene lutosa*** (LeConte) [p. 121]
Size: 9-11 mm. **Notes**: small, no elytral ridges as in most other *Megacyllene*, covered with yellow pubescence.

107. ***Megacyllene decora*** (Olivier) [p. 120-121]
Size: 12-25 mm. **Notes**: fairly thick elytral bands, but extremely variable (most common pattern is for basal yellow bands to fuse, while middle and apical yellow bands are of medium thickness or absent); yellow color dark, usually closer to orange than in other species, and middle band of pronotum, when present, does not reach lateral margins.

108. ***Megacyllene angulifera*** (Casey) [p. 120]
Size: 10-20 mm. **Notes**: most reliably separated from other species in the genus by the lack of distinct longitudinal elytral ridges near the suture; it also has fairly thick elytral bands (alternating yellow and white, or all pale yellow).

109. ***Megacyllene powersi*** Linsley & Chemsak [p. 121]
Size: 12-20 mm. **Notes**: This uncommon species resembles one extreme form of *M. decora*, but all the yellow bands of elytra are quite thick, and brighter yellow as in *M. robiniae*; when partial fusion of bands occurs, it is usually the middle yellow bands.

110. ***Megacyllene robiniae*** (Forster) [p. 121] "Locust Borer"
Size: 11-28 mm. **Notes**: one of our most well-known longhorns, similar to *M. caryae*, but flies later, and has all yellow elytral markings, and almost entirely yellow metepisternum.

111. ***Megacyllene caryae*** (Gahan), a = female, b-c = male [p. 120] "Painted Hickory Borer"
Size: 10-20 mm. **Notes**: always has large black patch on metepisternum, typically elytral bands narrow and alternating white and yellow.

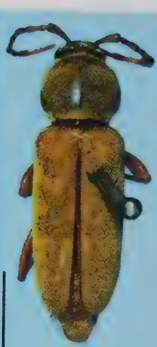
112. ***Glycobius speciosus*** (Say) [p. 120] "Sugar Maple Borer"
Size: 20-30 mm. **Notes**: a large, attractive, and distinctive species.

113. ***Xylotrechus nitidus*** (Horn) [p. 123]
Size: 10-12 mm. **Notes**: markings yellow, in distinctive pattern; elytra truncate, weakly toothed.

114. ***Xylotrechus convergens*** LeConte [p. 123]
Size: 8-13 mm. **Notes**: elytral and pronotal markings whitish to yellowish, in distinctive pattern. The pronotal markings are rarely enlarged and joined, similar to pattern in *X. integer*.

115. ***Neoclytus m. mucronatus*** (Fabricius) [p. 122]
Size: 8-20 mm. **Notes**: a robust species with strong spines at elytral and femoral apices, very distinctive markings.

116. ***Neoclytus scutellaris*** (Olivier) [p. 122]
Size: 7-16 mm. **Notes**: somewhat similar to preceding, but distinctive band across pronotum and grayish elytral bases.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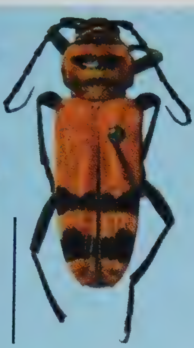
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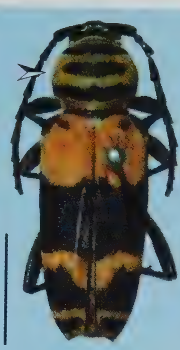
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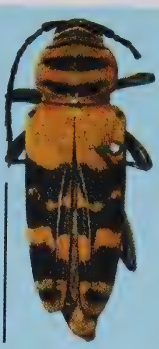
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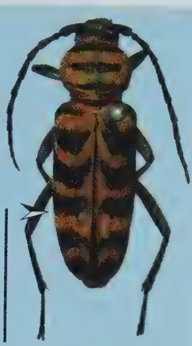
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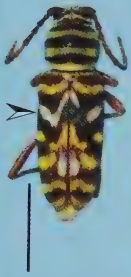
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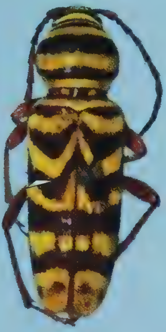
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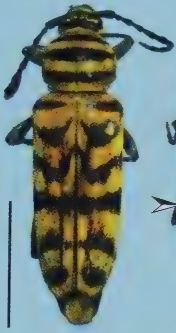
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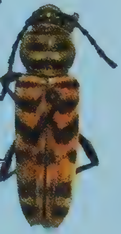
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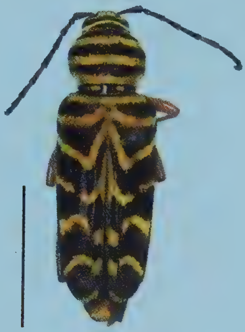
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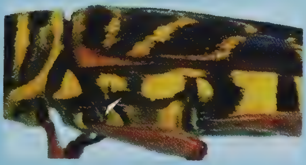
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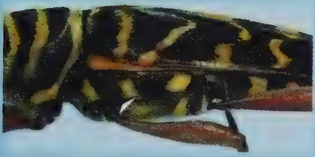
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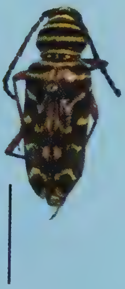
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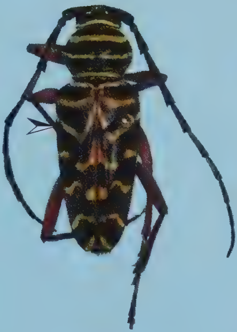
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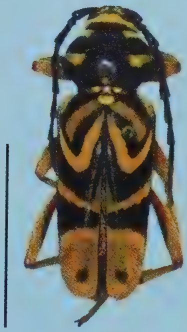
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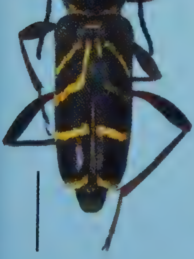
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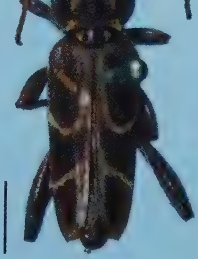
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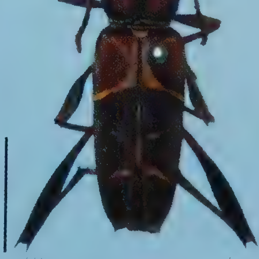
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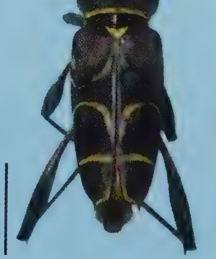
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PLATE 11: Figures 117-132

117. ***Neoclytus caprea*** (Say) [p. 121] "Banded Ash Borer"
Size: 8-17 mm. **Notes**: a relatively hairy species, with the first two elytral bands typically joined along the midline to form two loops, and a distinct stripe behind the head.

118. ***Clytus marginicollis*** Castelneau & Gory [p. 120]
Size: 6-10 mm. **Notes**: compact body shape and banding pattern distinctive, somewhat resembling a small, hairy wasp.

119. ***Clytus ruricola*** (Olivier) [p. 120]
Size: 10-15 mm. **Notes**: black body with strong yellow bands; middle "U"-shaped elytral band is distinctive.

120. ***Xylotrechus schaefferi*** Schott [p. 123-124]
Size: 8-14 mm. **Notes**: markings fairly distinctive, though sometimes reduced. Males with granulate oval patches on head above eyes, as is seen in some other species (e.g., Fig. 132).

121. ***Xylotrechus gemellus*** Casey [p. 123] (extinct?)
Size: 14-15 mm. **Notes**: robust species slightly similar to the following in appearance, but with thick middle and apical elytral bands. The female of *gemellus* also has the 5th sternite without an apical notch (though the pygidium does have one), further distinguishing it from similar species.

122. ***Xylotrechus undulatus*** (Say), a = male, b = female [p. 124]
Size: 10-16 mm. **Notes**: combination of elytral and pronotal markings is distinctive among NE species, and differs slightly between the sexes as shown. Females tend to have the pale pubescence more yellowish than in males. The pale markings at the sides of the pronotal base are somewhat variably developed, but never as much as seen in *X. integer*.

123. ***Xylotrechus integer*** (Haldeman) [p. 123]
Size: 9-15 mm. **Notes**: pronotum very broad, with considerable white on sides and dorsally; elytral markings somewhat similar to males of *X. undulatus*, with some weak longitudinal stripes medially.

124. ***Xylotrechus a. annosus*** (Say) [p. 122]
Size: 9-15 mm. **Notes**: pronotum and elytra with short, almost bristly white pubescence over surface, giving a distinctive grizzled appearance.

125. ***Sarosesthes fulminans*** (Fabricius) [p. 122]
Size: 12-22 mm. **Notes**: Distinctive "eyespot" on pronotum and thin, angulate elytral bands make this species easily recognized.

126. ***Neoclytus l. leucozonus*** (Castelneau & Gory) [p. 122]
Size: 5-12 mm. **Notes**: somewhat variable in size and markings, it resembles following but with slender antennae, middle elytral band more oblique (typically forming an inverted "V" shape), apical band more transverse.

127. ***Neoclytus horridus*** (LeConte) [p. 121-122]
Size: 6-11 mm. **Notes**: similar to preceding but with more slender body, more elongate pronotum, stronger apical elytral spines, and antennae clearly thickened at the tips; also, middle elytral band roughly "M"-shaped or transverse, apical band more oblique.

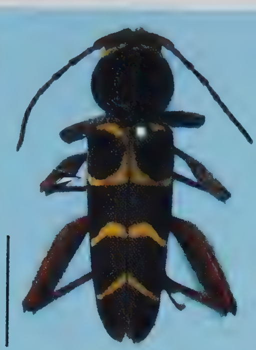
128. ***Neoclytus approximatus*** (LeConte) [p. 121]
Size: 6-11 mm. **Notes**: small, distinctive reddish species with three yellow elytral bands, the middle one strongly angled, and antennae thickened at tips.

129. ***Xylotrechus colonus*** (Fabricius) [p. 123] "Rustic Borer"
Size: 8-15 mm. **Notes**: broad pale markings in distinctive pattern, and narrow, sinuate basal yellow band.

130. ***Xylotrechus s. sagittatus*** (Germar) [p. 123]
Size: 12-25 mm. **Notes**: reddish, with pale pubescence primarily down midline of elytra.

131. ***Xylotrechus aceris*** Fisher [p. 122] "Gall-making Maple Borer"
Size: 10-14 mm. **Notes**: Small anterior pronotal markings are whitish and continue to the ventral margin, distinguishing this from the following.

132. ***Xylotrechus quadrimaculatus*** (Haldeman) [p. 123] "Birch and Beech Girdler"
Size: 8-15 mm. **Notes**: somewhat similar to preceding, but with several well-defined, yellowish thoracic markings (including mesepisternum), and more strongly oblique elytral bands.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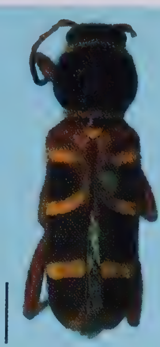
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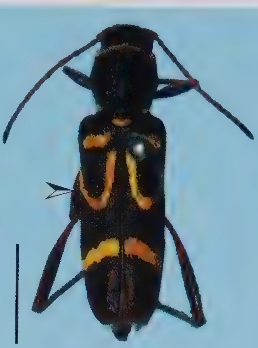
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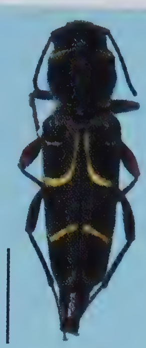
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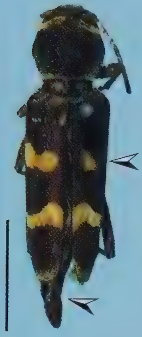
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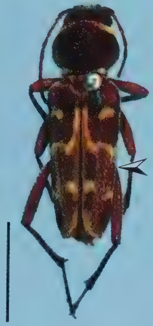
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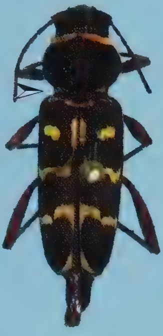
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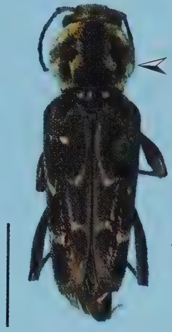
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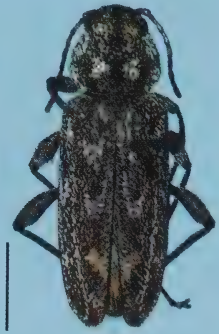
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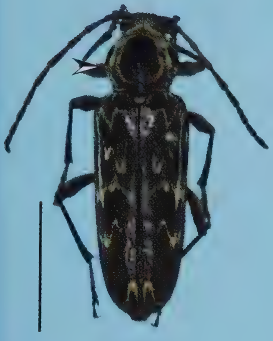
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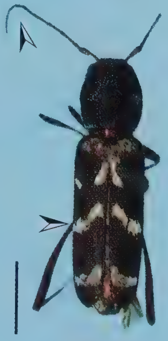
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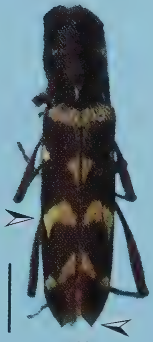
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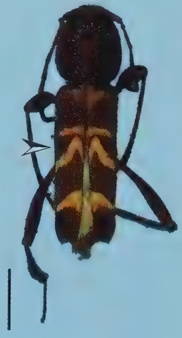
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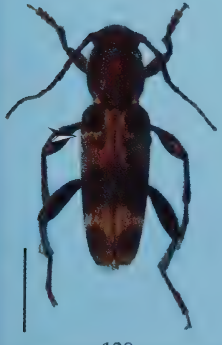
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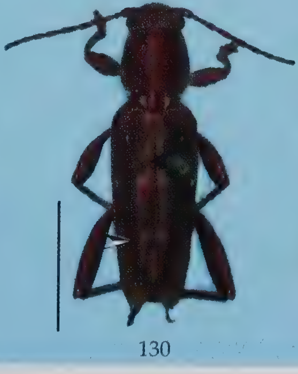
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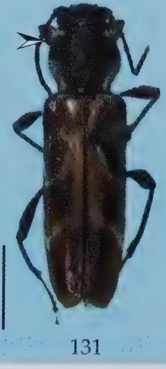
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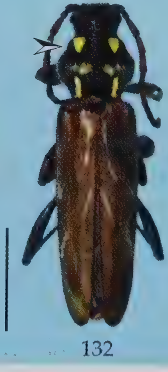
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PLATE 12: Figures 133-145

133. ***Oeme r. rigida*** (Say) [p. 45]
Size: 6-20 mm. **Notes**: pale, elongate body with strongly constricted pronotal base and prickly antennae.

134. ***Achryson surinamum*** (Linnaeus) [p. 46]
Size: 10-25 mm. **Notes**: pale, shiny, and somewhat variable in appearance, but no other NE longhorns have similar elytral markings, though sometimes the thoracic markings resemble those of *Curius dentatus*.

135. ***Curius dentatus*** Newman [p. 50]
Size: 5-7 mm. **Notes**: small species with very distinctive markings (sometimes reduced on elytra), small tooth on underside of all femora.

136. ***Penichroa fasciata*** (Stephens) [p. 47]
Size: 7-14 mm. **Notes**: The pale markings are variable in extent, and sometimes reduced to four spots (similar to the *Tylonotus bimaculatus*). The slender body, long antennae, and long thin hairs on elytra in combination with the markings are fairly distinctive.

137. ***Hesperophanes pubescens*** (Haldeman) [p. 47]
Size: 15-22 mm. **Notes**: The uniformly pale brown body lacks spines or any other prominent surface sculpture, and the pubescence is uniformly pale, with a slight swirled patterning on the pronotum.

138. ***Zamodes obscurus*** LeConte [p. 47] (extinct?)
Size: 11 mm. **Notes**: The elytra and pronotum have a layer of appressed hairs among which are scattered sparse, erect, very long hairs. The antennae are very hairy, the tubercles at the antennal base bulging, and the pronotum somewhat flattened dorsally with low, irregular calli.

139. ***Anelaphus m. moestus*** (LeConte) [p. 48]
Size: 9-15 mm. **Notes**: uniformly brown, with spiny antennae, broader body, and shining elytra.

140. ***Gracilia minuta*** (Fabricius) [p. 46]
Size: 4-6 mm. **Notes**: shape, size, and swollen femora in combination with the dull integument are distinctive.

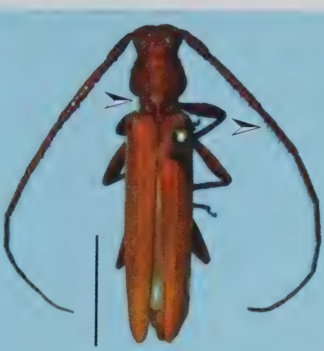
141. ***Tylonotus masoni*** (Knull) [p. 47]
Size: 8-10 mm. **Notes**: elytra and legs uniformly brownish, pronotal calli poorly defined, head very short. Though nondescript in color, the pronotal shape and short head are relatively distinctive.

142. ***Tylonotus bimaculatus*** Haldeman [p. 47] “Ash and Privet Borer”
Size: 9-18 mm. **Notes**: markings rather distinctive; also, pronotal calli fairly well-defined, femora relatively pale.

143. ***Semanotus l. ligneus*** (Fabricius) [p. 119] “Cedar Tree Borer”
Size: 8-12 mm. **Notes**: generally has much more orange on elytra than following species, though some specimens are largely dark. Typically less hairy than following species, but this is difficult to quantify in a reliable manner. All individuals well-marked with red probably will belong to this species.

144. ***Semanotus litigiosus*** (Casey) [p. 119] “Fir Tree Borer”
Size: 8-12 mm. **Notes**: typically has reddish marks on elytra reduced or absent (if present, small spots or vague transverse bands). Almost impossible to tell this uncommon species from dark variants of *S. ligneus*, which may co-occur.

145. ***Hylotrupes bajulus*** (Linnaeus), a = female, b = male [p. 53] “Old House Borer”
Size: 8-20 mm. **Notes**: hairy pronotum with two prominent lateral calli and small pubescent spots on elytra make this species distinctive despite somewhat variable size and coloration (some individuals are rather pale, especially elytra).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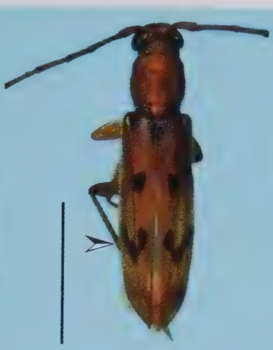
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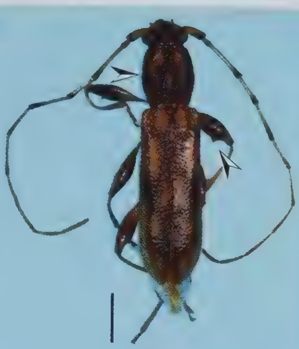
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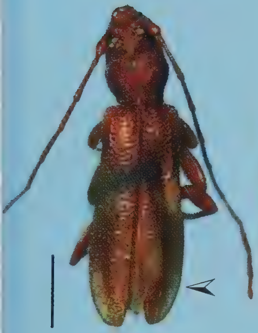
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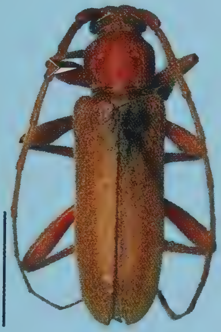
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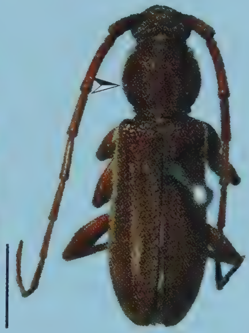
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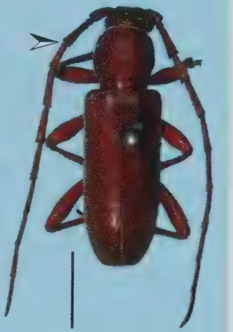
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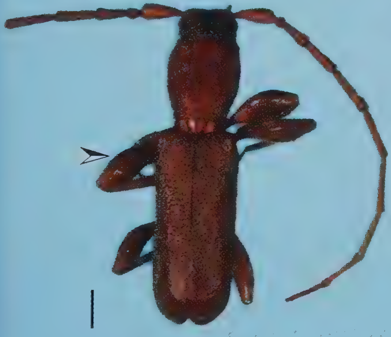
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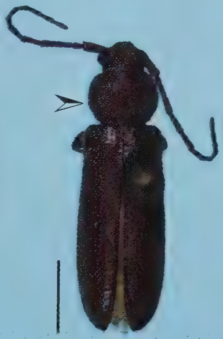
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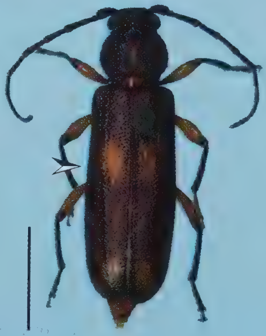
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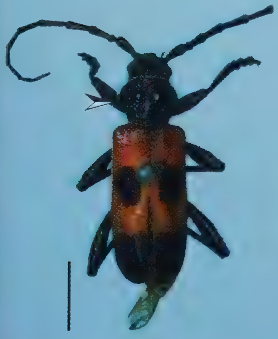
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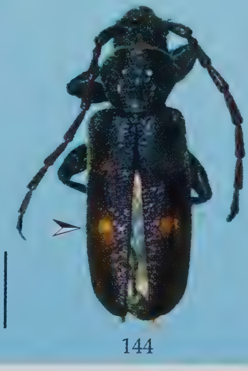
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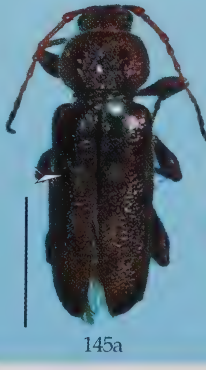
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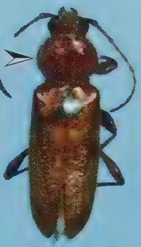
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PLATE 13: Figures 146-158

146. ***Eburia quadrigeminata*** (Say) [p. 46] "Ivory-marked Beetle"
Size: 12-25 mm. **Notes**: more golden-orange than the following species, with a slightly narrower pronotum (with lateral spines and dorsal calli more protuberant), elytra with ivory spots generally larger (though rather variable in size), basal pair touching closely, body less visibly pubescent.

147. ***Eburia haldemani*** LeConte [p. 46]
Size: 15-30 mm. **Notes**: brownish, elytra with ivory spots quite small, basal pair of spots distinctly separated from one another, pubescence distinct.

148. ***Knulliana c. cincta*** (Drury) [p. 46] "Banded Hickory Borer"
Size: 15-30 mm. **Notes**: The markings on the dull elytra may sometimes be absent, but there are no other NE longhorns of similar size and coloration that have strong spines on the femora, pronotum, *and* elytral apices. The scutellum is also much longer than broad.

149. ***Enaphalodes hispicornis*** (Linnaeus) [p. 49]
Size: 25-40 mm. **Notes**: large and relatively nondescript aside from pronotal sculpture, but the spinose antennae and elytra, which are always uniformly pubescent, make this species distinctive.

150. ***Enaphalodes atomarius*** (Drury) [p. 48-49]
Size: 20-30 mm. **Notes**: distinguished from following species by very strong, deep punctures of elytral humeri, less complete coverage of elytral pubescence, last abdominal sternite of male squared-off, that of female notched forming two small lobes.

151. ***Enaphalodes cortiphagus*** (Craighead) [p. 49] "Oak-bark Scarrer"
Size: 20-30 mm. **Notes**: similar in general appearance to preceding species but with much weaker humeral punctation, often obscured by grayish pubescence; last abdominal sternite of male rounded, that of female only slightly concave at tip.

152. ***Enaphalodes rufulus*** (Haldeman) [p. 49] "Red Oak Borer"
Size: 15-28 mm. **Notes**: differs from preceding two species by having integument reddish-brown, hairs golden and rather dense.

153. ***Parelaphidion aspersum*** (Haldeman), a = female, b = male [p. 49]
Size: 14-21 mm. **Notes**: antennae and elytra with spines, pronotum with large glabrous areas, especially midline. Very similar to the following, though of larger general size, best distinguished by longer antennae; 4th segment longer than scape, total length almost equal to (in female) or clearly exceeding body length (in male).

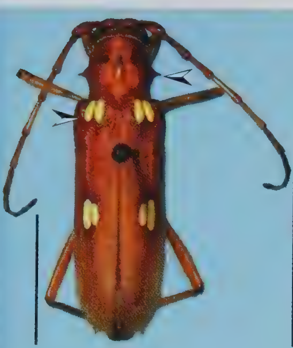
154. ***Parelaphidion incertum*** (Newman), a = female, b = male [p. 49-50] "Mulberry Bark Borer"
Size: 8-15 mm. **Notes**: very similar to the preceding species, but generally smaller, distinguished by shorter antennae; not reaching apical third of elytra (in female) or roughly equal to body length (in male).

155. ***Elaphidion mucronatum*** (Say) [p. 48] "Spined Bark Borer"
Size: 13-20 mm. **Notes**: very long femoral spines, which readily distinguish it from *Parelaphidion* species, a longer spine on 3rd antennal segment, and has slightly denser elytral pubescence.

156. ***Stenosphenus notatus*** (Olivier) [p. 50]
Size: 9-16 mm. **Notes**: Red pronotum with black pronotal spot (sometimes almost absent) and especially the shiny black elytra with short white hairs make this species distinctive.

157. ***Crossidius d. discoideus*** (Say) [p. 126]
Size: 9-12 mm. **Notes**: pronotum largely red, sometimes with black markings, elytra black with reddish-orange markings, slightly dull, and with fine pubescence.

158. ***Crossidius pulchellus*** (Say), a = male, b = female [p. 126]
Size: 8-12 mm. **Notes**: pronotum largely or entirely dark, elytra with markings more yellowish than preceding species, surface more visibly shining.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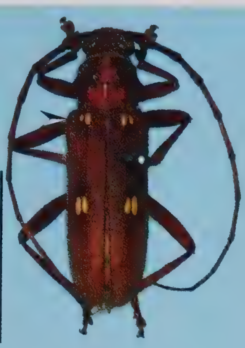
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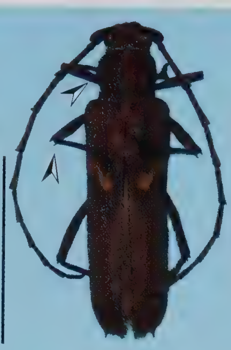
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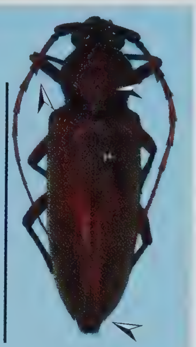
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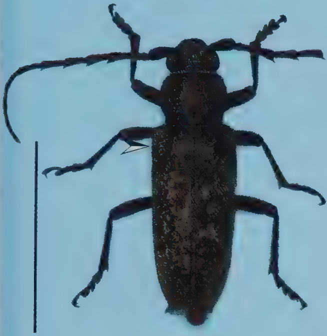
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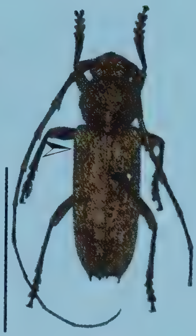
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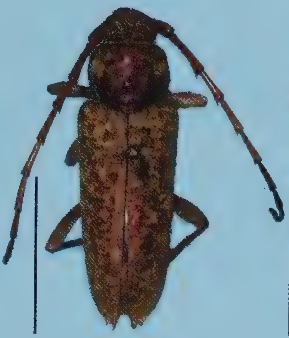
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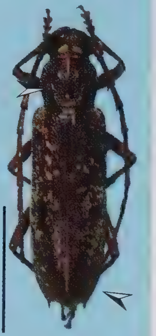
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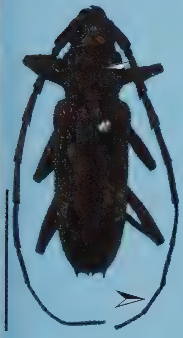
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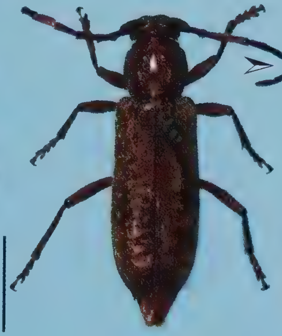
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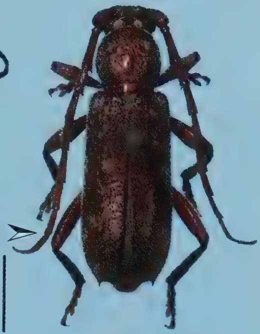
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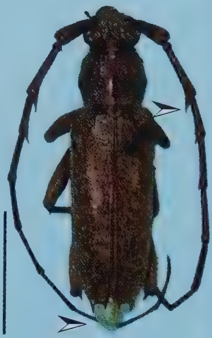
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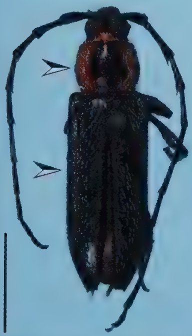
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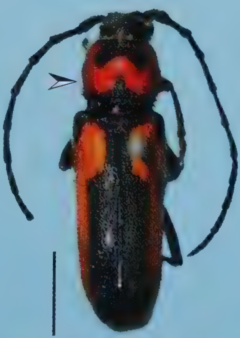
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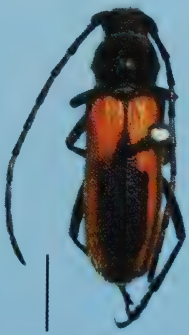
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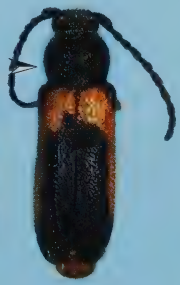
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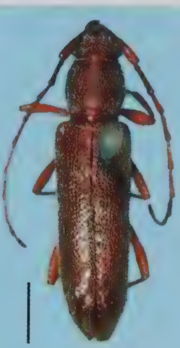
PLATE 14: Figures 159-172

159. ***Micranoplium unicolor*** (Haldeman) [p. 49]
Size: 7-9 mm. **Notes**: small, slender, with uniform elytral and pronotal pubescence, no spines at elytral tips, somewhat resembling *Anelaphus*.
160. ***Anelaphus pumilus*** (Newman) [p. 48]
Size: 8-10 mm. **Notes**: small, elongate, elytra mottled, with long scattered hairs. The absence of spines at elytral tips and reduced antennal spines readily distinguish this from the following two species.
161. ***Anelaphus villosus*** (Fabricius), a = female, b = male [p. 48] "Twig Pruner"
Size: 12-20 mm. **Notes**: distinguished from the following by typically broader body, which is often also slightly more reddish, and sparser, more mottled pubescence, which is more evenly distributed. The last male sternite is more rounded.
162. ***Anelaphus parallelus*** (Newman), a = female, b = male [p. 48] "Oak Twig Pruner"
Size: 8-20 mm. **Notes**: similar to *A. villosus*, distinguished by more slender body with pubescence more stripe-like, largely due to narrow glabrous lines; *parallelus* also has the lateral pubescent lines on the pronotum much less frequently interrupted, and the last male sternite is more truncate. In both species, the pronotum of the male is slightly broader and more granulate than in the female.
163. ***Aneflomorpha subpubescens*** (LeConte) [p. 47] "Oak Stem Borer"
Size: 14-18 mm. **Notes**: This distinctive large, light brown species has the pronotum elongate, strongly punctate, and darker than the elytra.
164. ***Psyrassa pertenuis*** (Casey) [p. 50]
Size: 7-12 mm. **Notes**: slender species with shining, weakly punctate pronotum, similar to following, but differs most noticeably in longer spine on 3rd antennal segment (spine alone is twice the length of the 2nd antennal segment) and more slender pronotum.
165. ***Psyrassa unicolor*** (Randall) [p. 50] "Branch Pruner"
Size: 7-13 mm. **Notes**: slightly shorter pronotum, much shorter spine on 3rd antennal segment, and hairs on elytra denser and shorter than in *P. pertenuis*.
166. ***Heterachthes ebenus*** Newman, male [p. 50]
Size: 6-12 mm. **Notes**: dull, dark, unmarked; in combination with elongate shape, this species is distinctive. Males of this and preceding species have basal antennal segments thickened (as shown), which is also very distinctive.
167. ***Heterachthes pallidus*** Haldeman [p. 50]
Size: 7-12 mm. **Notes**: shiny, reddish with pale elytral markings, or entirely pale. Slightly resembles *Psyrassa*, but has unspined antennae and elytra, and wrinkled pronotum.
168. ***Obrium rubidum*** LeConte [p. 51]
Size: 9-11 mm. **Notes**: distinctive, with dullish, punctate pronotum, shining reddish elytra.
169. ***Obrium maculatum*** (Olivier) [p. 51]
Size: 4-7 mm. **Notes**: pronotum strongly constricted at base and bulging anteriorly, elytra with distinctive brown markings.
170. ***Obrium rufulum*** Gahan [p. 51]
Size: 5-8 mm. **Notes**: uniformly pale, shining; pronotum with lateral tubercles; shape distinctive.
171. ***Batyle s. suturalis*** (Say) [p. 125-126]
Size: 7-9 mm. **Notes**: Bright red body with black appendages and thin black pubescence is distinctive.
172. ***Smodicum cucujiforme*** (Say) [p. 45] "Flat Powder-post Beetle"
Size: 7-10 mm. **Notes**: small, pale, shiny, and extremely flattened. Resembles a flat bark beetle (Cucujidae), but the tarsi and antennal structure distinguish it.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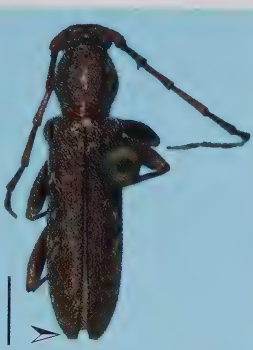
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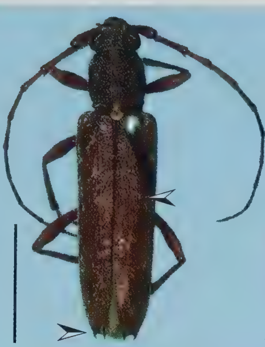
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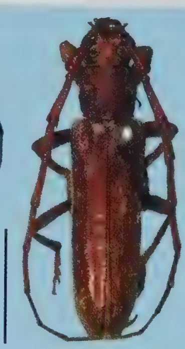
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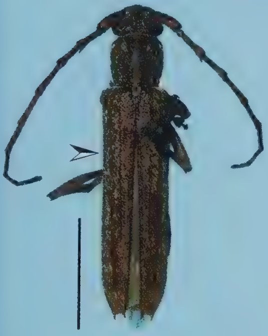
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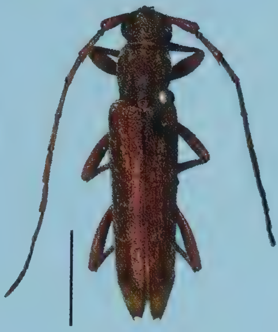
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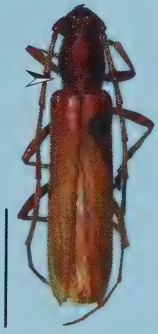
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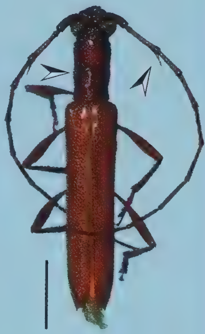
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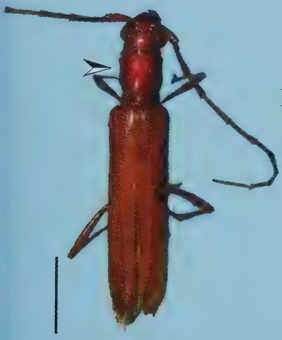
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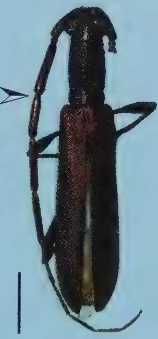
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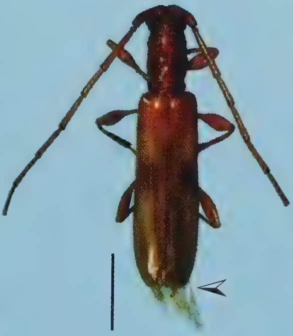
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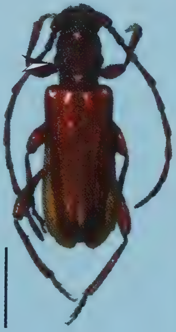
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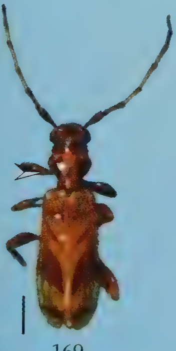
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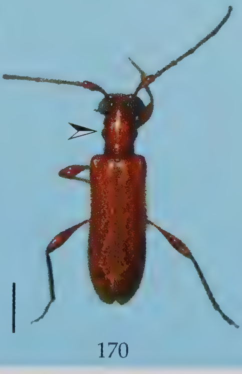
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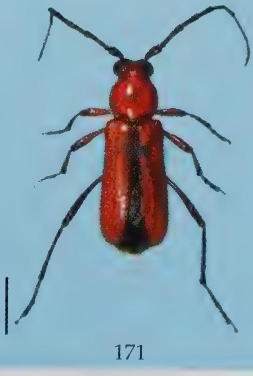
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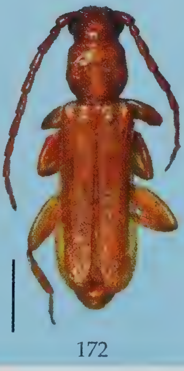
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PLATE 15: Figures 173-185

173. ***Methia pusilla*** (Newman) [p. 45]
Size: 5-9 mm. **Notes**: elytra soft, shortened slightly and typically pale; eyes large, bulging, almost touching dorsally but undivided.

174. ***Tessaropa tenuipes*** (Haldeman) [p. 45-46]
Size: 4-6 mm. **Notes**: distinguished from other longhorns with short elytra by shape of prothorax, long antennae with first segment much broader than others, short tarsi, and completely divided eyes.

175. ***Necydalis mellita*** (Say), a = male, b = female [p. 28-29]
Size: 12-22 mm. **Notes**: adults very wasplike in appearance, with constricted pronotum, very short elytra and long, slender body.

176. ***Molorchus b. bimaculatus*** Say [p. 51]
Size: 5-8 mm. **Notes**: head and thorax black, elytra very short with dark tips, femora strongly clubbed.

177. ***Molorchus bimaculatus celti*** Knull [p. 51]
Size: 8-12 mm. **Notes**: larger than nominate subspecies, pronotum and antennae more elongated. Extremely hard to separate except for largest specimens.

178. ***Molorchus bimaculatus corni*** Haldeman [p. 51]
Size: 5-7 mm. **Notes**: similar to nominate subspecies, but with red prothorax, elytra often dark.

179. ***Callimoxys s. sanguinicollis*** (Olivier) [p. 51]
Size: 7-12 mm. **Notes**: distinctive tapering club-shaped elytra and slender clubbed legs; pronotum black in males, usually red in females.

180. ***Metacmaeops vittata*** (Swederus) [p. 36]
Size: 6-8 mm. **Notes**: usually with orange head and pronotum, but sometimes darkened, with a dark median stripe on each elytron. The markings and shape, along with the generally light body color and entire eyes, make this species fairly distinctive, and males have strong toothlike projections on the fore tibiae.

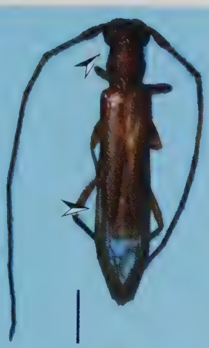
181. ***Analeptura lineola*** (Say), a = female, b = male [p. 29]
Size: 6-12 mm. **Notes**: pronotum dark, punctate, and dorsally arched, with fine golden pubescence that often forms an elongate median reflective spot, antennae with banded apical segments, and yellow legs. The elytral coloration is rather variable, typically with marginal and median stripes, but sometimes the median stripes are lost, or they may be broadened and fused with the lateral stripes.

182. ***Strangalepta abbreviata*** (Germar) [p. 38]
Size: 10-14 mm. **Notes**: may have the elytra entirely black or pale, but most commonly there is only an abbreviated pale stripe. It has a relatively globose pronotum (without an apical collar as in *Pidonia*), which, like the elytra, is weakly punctate, with short pubescence. The body is more elongate than in the related *S. pubera* (Fig. 44).

183. ***Pidonia aurata*** (Horn) [p. 36]
Size: 7-10 mm. **Notes**: Like the other *Pidonia* species, *aurata* has a strongly constricted neck, and an almost spherically swollen pronotum; this species is distinguished by the reddish body and appendages, and mostly light elytra which are narrowly darker along margins. This coloration is quite constant.

184. ***Pidonia densicollis*** (Casey) [p. 36-37]
Size: 7-9 mm. **Notes**: elytra much darker than the preceding species, with yellow median stripes. The pronotum is mostly black, though sometimes with yellow anterior or posterior margins. The head and pronotum are punctate and pubescent, unlike the following species, and the elytra are slightly duller.

185. ***Pidonia ruficollis*** (Say) [p. 37]
Size: 6-9 mm. **Notes**: color quite variable; the pronotum varies from red to black, and the elytra vary from black to black with yellow median stripes. Some of these individuals thus strongly resemble the preceding species, but the head and pronotum are almost impunctate and thinly-haired, and the elytra slightly shinier.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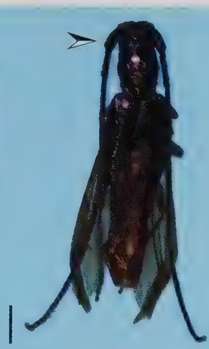
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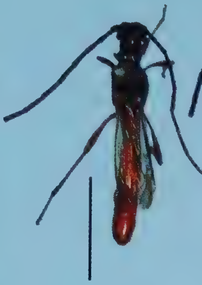
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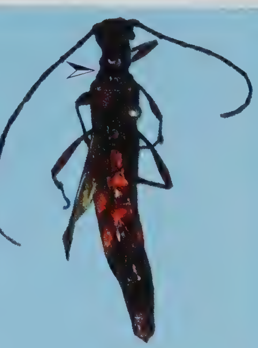
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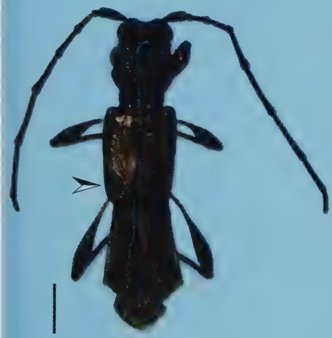
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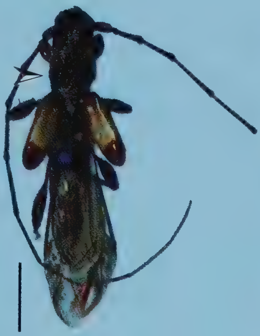
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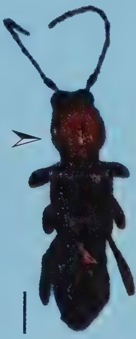
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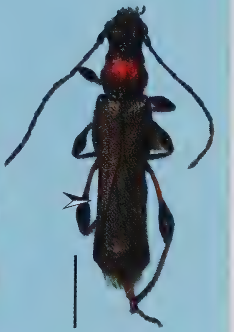
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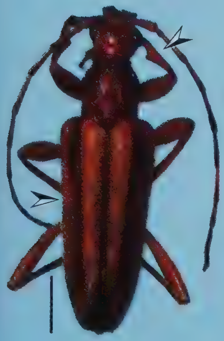
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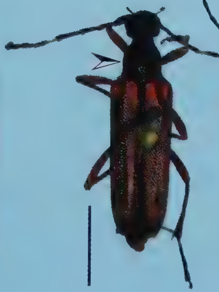
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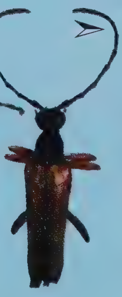
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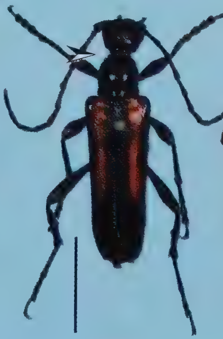
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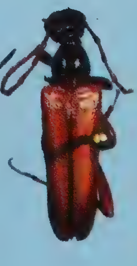
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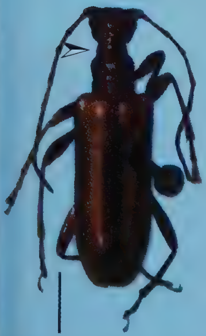
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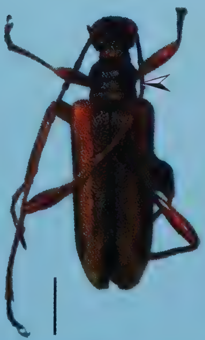
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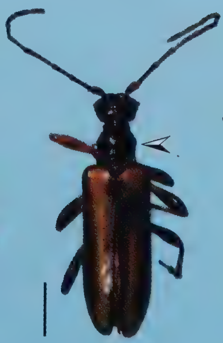
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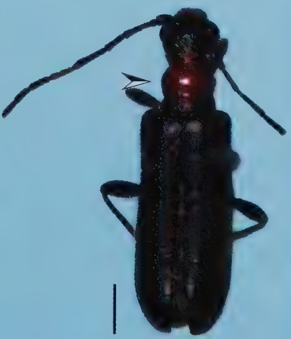
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PLATE 16: Figures 186-198a

186. ***Pronocera c. collaris*** (Kirby) [p. 119]
Size: 9-14 mm. **Notes**: slightly swollen femora, pronotum polished and narrower than the elytra, and dull, densely punctate elytra.

187. ***Batyle i. ignicollis*** (Say) [p. 125]
Size: 8-13 mm. **Notes**: similar in coloration to the preceding, but generally more sparsely punctate, with smoother elytra, and with longer hairs, especially on the globose pronotum.

188. ***Phymatodes testaceus*** (Linnaeus) [p. 118] "Tanbark Borer"
Size: 8-17 mm. **Notes**: quite variable in color (though never with a truly dark body), with distinct pronotal calli, but most recognizable by the very finely punctate elytra.

189. ***Phymatodes amoenus*** (Say) [p. 53]
Size: 5-7 mm. **Notes**: body entirely pale reddish, elytra metallic blue, fairly easily confused with *P. lengi*, but pronotum more rounded, body and legs slightly shorter and thicker, abdomen paler, 2nd antennal segment longer.

190. ***Phymatodes lengi*** Joutel [p. 118]
Size: 5-7 mm. **Notes**: very similar to *P. amoenus*, with darker abdomen, different pronotal shape and sculpture, longer body, etc.

191. ***Phymatodes lividus*** (Rossi) [p. 118]
Size: 5-8 mm. **Notes**: pronotum darkened at sides with light central depression, resembling some individuals of *P. testaceus*, but with more clearly punctate elytra and less developed pronotal calli.

192. ***Phymatodes maculicollis*** LeConte [p. 118]
Size: 7-9 mm. **Notes**: pronotum reddish with dark band or spot in center, elytra with fine pubescence, somewhat resembling a firefly/lightningbug (Lampyridae) but without light organ.

193. ***Phymatodes aereus*** (Newman) [p. 53]
Size: 6-12 mm. **Notes**: distinguished by combination of uniform brown body color, yellowish legs, and strongly punctate elytra.

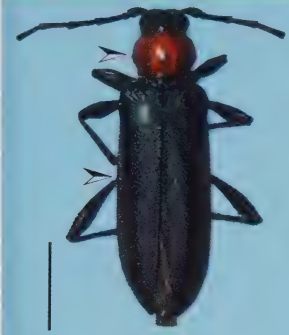
194. ***Phymatodes ater*** LeConte [p. 53]
Size: 5-7 mm. **Notes**: dark, somewhat shining body and strongly punctate elytra, sometimes (but not always) with oblique pale bands at base or tip. The dark, shining, punctate elytra without markings are distinctive; those with markings (as shown) can be told from *P. varius* by the oblique band orientation rather than transverse, and the 3 pronotal calli. An undescribed species is similar to the unmarked form, but with finer elytral punctures (see text).

195. ***Phymatodes dimidiatus*** (Kirby) [p. 118]
Size: 8-11 mm. **Notes**: distinguished by dull pronotum and elytra, and elytra red at base, black at tip.

196. ***Phymatodes varius*** (Fabricius) [p. 118]
Size: 5-10 mm. **Notes**: usually somewhat dull, pronotum and base of elytra usually reddish (sometimes black), with paired transverse or arcuate white bands on elytra. Black individuals distinguished from well-marked specimens of *P. ater* by duller body, lack of pronotal calli, more transverse markings.

197. ***Euderces pini*** (Olivier) [p. 125]
Size: 6-8 mm. **Notes**: similar to the red form of *E. picipes*, typically with head, pronotum, and elytral bases red, but always with an extra oblique pubescent stripe posteriorly on elytra.

198a. ***Euderces picipes*** (Fabricius) [p. 124-125]
Size: 5-9 mm. **Notes**: usually entirely black (Fig. 198b), but in more southern areas the legs and elytral bases are reddish (Fig. 198a); pronotum longitudinally striate, ivory ridges of elytra angled forward slightly toward midline.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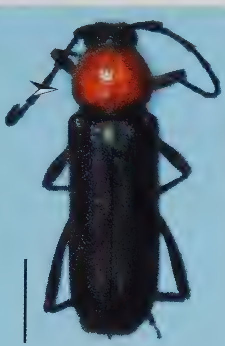
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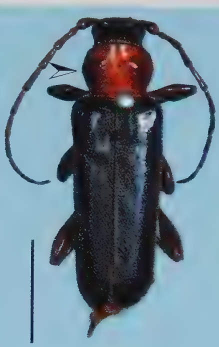
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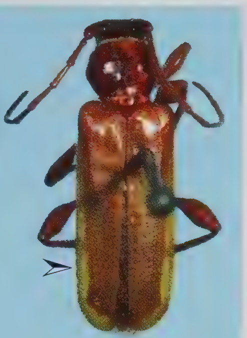
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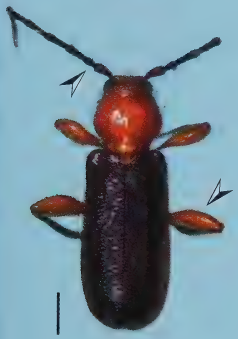
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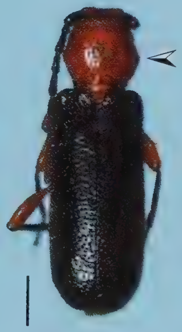
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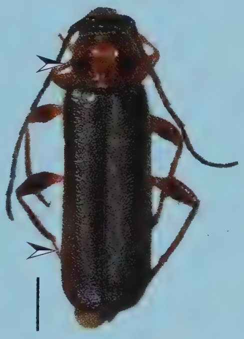
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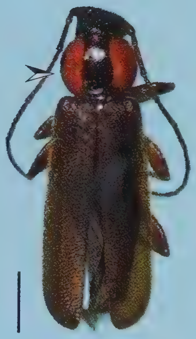
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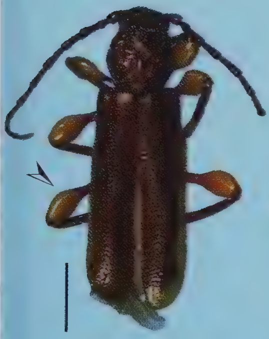
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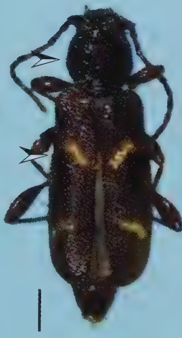
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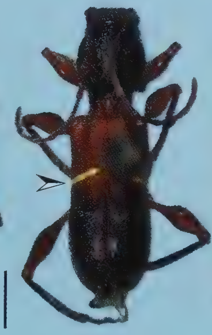
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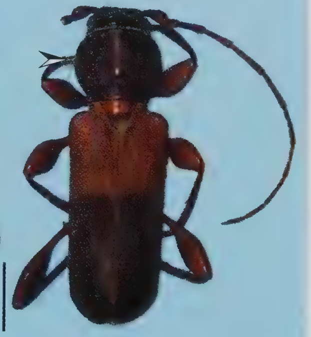
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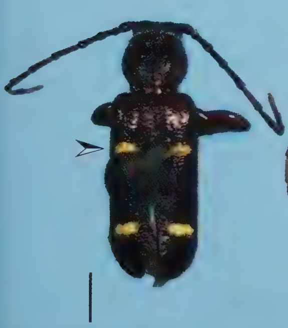
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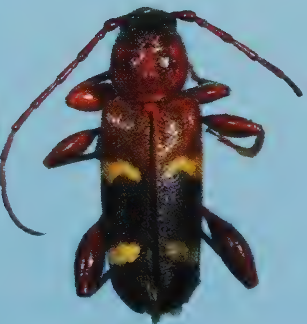
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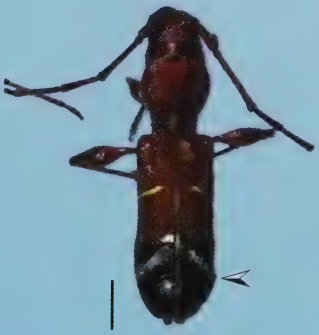
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PLATE 17: Figures 198b-211

198b. ***Euderces picipes*** (Fabricius) [p. 124-125]
see preceding plate

199. ***Neoclytus j. jouteli*** Davis [p. 122]
Size: 4-8 mm. **Notes**: small, black, with diffuse posterior elytral bands resembling those of *Euderces pini*, but body more cylindrical, ridges on pronotum (as in other *Neoclytus*), and antennae thickened at tips.

200. ***Tilloclytus geminatus*** (Haldeman) [p. 124]
Size: 5-7 mm. **Notes**: yet another somewhat antlike species, with arching pronotum and small lumps at elytral bases, but with distinctive markings, most notably with oblique glabrous stripes on elytral bases, outlined with single row of white hairs. Extreme southern specimens more reddish.

201. ***Euderces r. reichei*** LeConte [p. 125]
Size: 4-5 mm. **Notes**: very small, pronotum punctate rather than longitudinally striate as in other species; ivory elytral ridges transverse rather than oblique, no posterior stripe.

202. ***Clytoleptus albofasciatus*** (Castelneau & Gory) [p. 120] "Grape Trunk Borer"
Size: 7-10 mm. **Notes**: The particular minimal pattern of white stripes is distinctive; may or may not have red elytral bases.

203. ***Psenocerus supernotatus*** (Say) [p. 131-132] "Currant-tip Borer"
Size: 4-8 mm. **Notes**: The pattern of markings and small swellings at base of the punctate elytra are fairly distinctive, though slightly variable. A bit more cylindrical than other ant-resembling species.

204. ***Cyrtophorus verrucosus*** (Olivier) [p. 124]
Size: 7-11 mm. **Notes**: variable as to the amount of reddish coloration, as with many other antlike longhorns; the markings are slightly similar to the following genus, but *verrucosus* has a high-arching pronotum and pronounced knobs at the elytral bases.

205. ***Microclytus gazellula*** (Haldeman) [p. 124]
Size: 5-8 mm. **Notes**: antennae shorter and hairier than following species, and legs hairier. Otherwise, pattern of pubescent markings fairly distinctive.

206. ***Microclytus compressicollis*** (Castelneau & Gory) [p. 124]
Size: 5-7 mm. **Notes**: extremely similar to the preceding species, can be difficult to separate without a microscope, but with antennae longer (2nd segment much shorter than others), not hairy, and legs also less hairy.

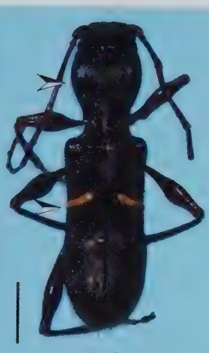
207. ***Cyrtinus pygmaeus*** (Haldeman) [p. 138-139]
Size: 2-4 mm. **Notes**: tiny, with two acute spines arising from elytral bases (visible from side) and small pubescent patches.

208. ***Michthisoma heterodoxum*** LeConte [p. 45]
Size: 5-9 mm. **Notes**: body shape and sculpture unique.

209. ***Rhopalophora longipes*** (Say) [p. 125]
Size: 6-9 mm. **Notes**: very distinctive appearance with slender, elongate body and long, clubbed femora; reddish pronotum with weak lateral pubescent stripes, and grayish elytra.

210. ***Ropalopus sanguinicollis*** (Horn) [p. 119]
Size: 10-17 mm. **Notes**: Combination of opaque black elytra, slightly clubbed legs, and broad, red, punctate pronotum is distinctive.

211. ***Physocnemum andreae*** (Haldeman) [p. 118-119] "Cypress Bark Borer"
Size: 17-21 mm. **Notes**: very distinctive; pale elytral ridges converge at middle, forming "X", body reddish-brown.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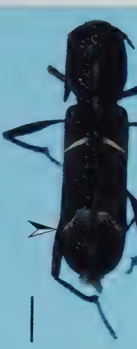
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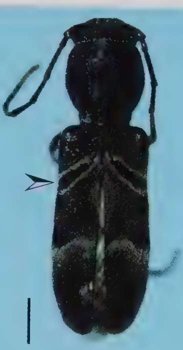
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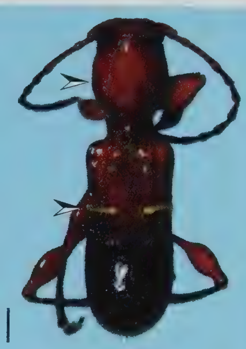
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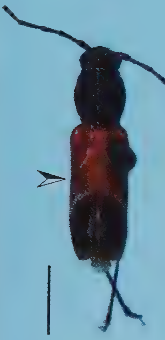
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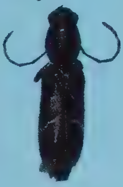
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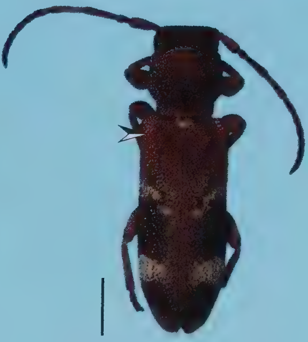
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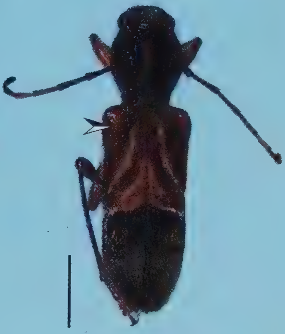
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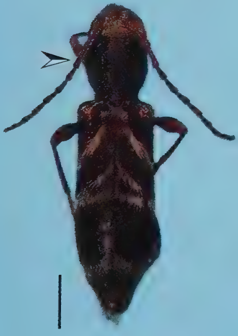
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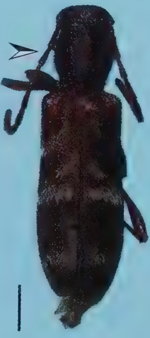
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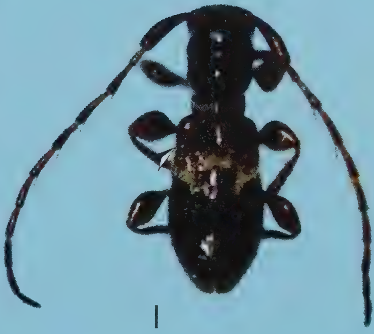
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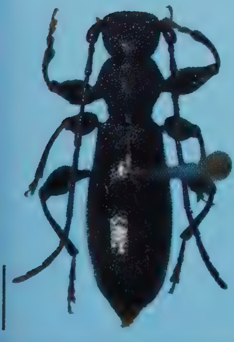
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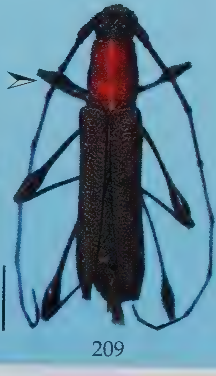
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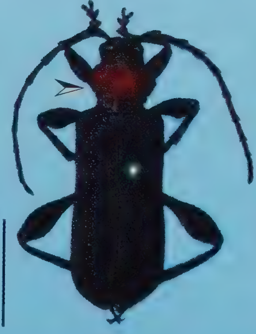
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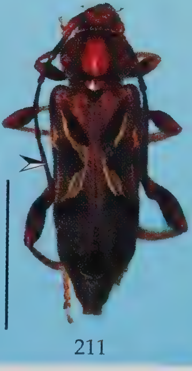
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PLATE 18: Figures 212-221

212. ***Physocnemum brevilineum*** (Say), a = male, b = female [p. 119] "Elm Bark Borer"
Size: 7-20 mm. **Notes**: elytra slightly shining, often pale or reddish in middle, punctures weakened apically, and with distinctive pattern of pale ridges.

213. ***Physocnemum violaceipenne*** Hamilton [p. 119]
Size: 8-17 mm. **Notes**: dark species with uniformly opaque pronotum and elytra, with ridges rarely dark (if so, lateral calli at base of pronotum make it recognizable as a *Physocnemum*).

214. ***Callidium schotti*** Schaeffer [p. 52]
Size: 9-15 mm. **Notes**: pronotal punctures distinct in middle but almost no space between them, elytra irregularly punctate and dull. Difficult to distinguish from *C. texanum*; the duller elytral surface is probably the most reliable feature. Also, *schotti* has an impunctate scutellum, slightly splayed elytral tips, and different host plants.

215. ***Callidium texanum*** Schaeffer, a = male, b = female [p. 52-53]
Size: 8-13 mm. **Notes**: pronotal punctures crowded, but with some shining space in between; elytra slightly shining but deeply punctate, parallel-sided rather than splayed out apically.

216. ***Callidium a. antennatum*** Newman, a = male, b = female [p. 52]
Size: 9-15 mm. **Notes**: dull elytra and pronotum with distinct granulate lateral zone in male (sinuate posteriorly) and completely roughened in female.

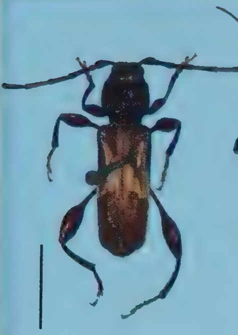
217. ***Callidium violaceum*** (Linnaeus), a = male, b = female [p. 53]
Size: 9-15 mm. **Notes**: usually more violet in color than blue; fairly easy to distinguish from other species by three small dorsal pronotal calli in females (surface otherwise irregularly roughened; if calli absent, this is only species with rough pronotum combined with slightly shiny elytra), males with "V"-shaped basal callus, very coarsely punctate and shining elytra, punctures fairly well-separated.

218. ***Callidium frigidum*** Casey, a = male, b = female [p. 52]
Size: 6-10 mm. **Notes**: this species is shining, typically green-tinted (if bluish, it can be difficult to separate from *C. texanum*), but also recognizable by pronotal punctures widely spaced in middle, and distinct punctures often visible in lateral areas (where other species are simply roughened and granulate laterally); epipleural margins of elytra curled under but typically splayed out apically.

219. ***Plinthocoelium s. suaveolens*** (Linnaeus), a = male, b = female [p. 52]
Size: 25-40 mm. **Notes**: attractive and distinctive large, metallic species, varying from green to blue, or bronze, often with hints of other colors. Legs, however, always with red femora.

220. ***Meriellum proteus*** (Kirby) [p. 53]
Size: 10-16 mm. **Notes**: Broad smooth median area of pronotum and yellow stripes on elytra (sometimes reduced) make this species distinctive, also yellowish femora in contrast to dark body.

221. ***Desmocerus palliatus*** (Forster) [p. 28] "Elderberry Borer"
Size: 18-26 mm. **Notes**: one of our most distinctive and attractive NE longhorns.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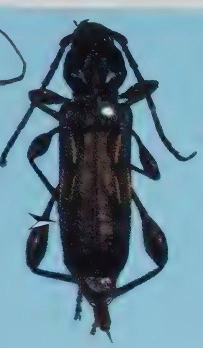
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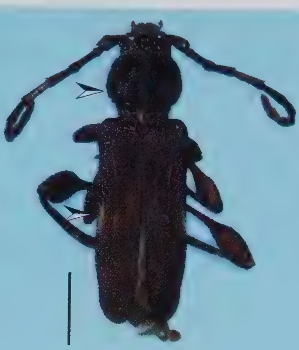
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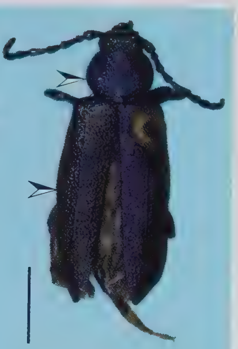
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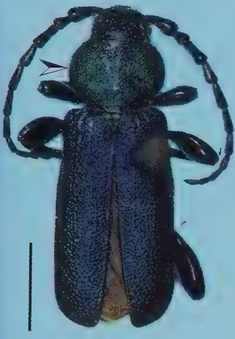
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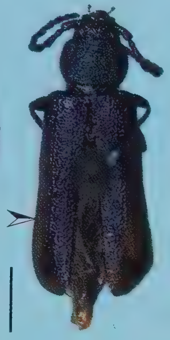
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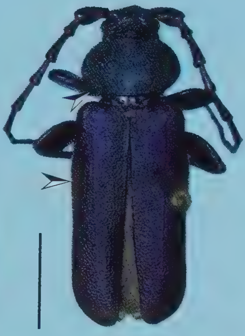
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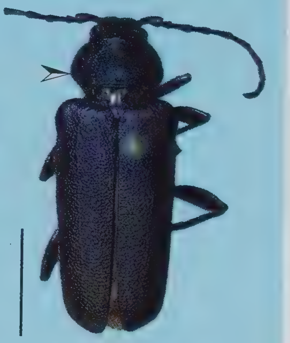
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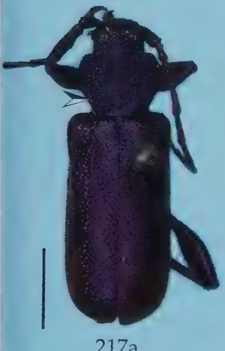
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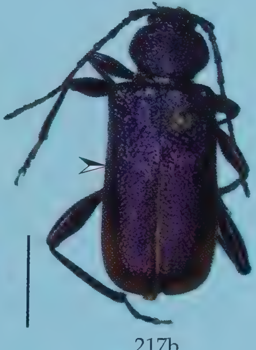
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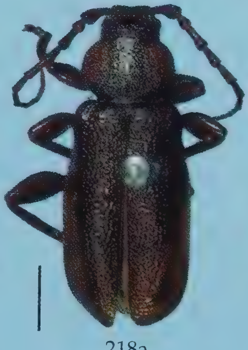
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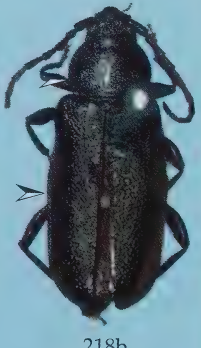
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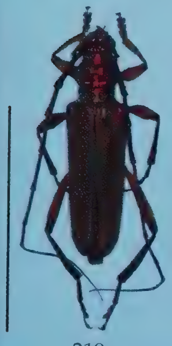
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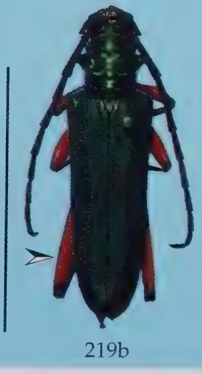
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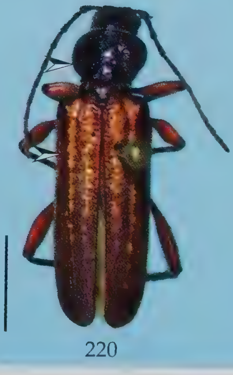
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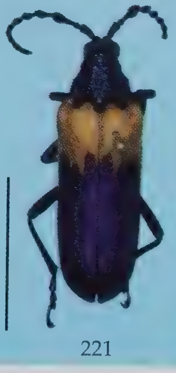
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PLATE 19: Figures 222-231

222. ***Purpuricenus axillaris*** Haldeman [p. 126] "White Oak Branch Girdler"
Size: 13-20 mm. **Notes**: broad, yellowish elytral band, body otherwise very black, opaque, with rough, pitted pronotum, as in following unnamed species. In *axillaris*, the lateral pronotal tubercles are typically large, the mid-dorsal tubercle is smooth, and the elytral surface immediately behind the yellow band is strongly punctate (Fig. 222b).

223. ***Purpuricenus*** sp. [p. 126]
Size: 12-14 mm. **Notes**: very difficult to distinguish from *P. axillaris* at first glance, but the lateral pronotal tubercles are small, the mid-dorsal tubercle is small and rough, and the elytral surface immediately behind the yellow band is virtually impunctate.

224. ***Purpuricenus humeralis*** (Fabricius) [p. 126]
Size: 13-20 mm. **Notes**: elytral markings limited to two reddish lateral triangles of various size, sometimes connecting at midline, otherwise black, opaque.

225. ***Tragidion coquus*** (Linnaeus), a = male, b = female [p. 126-127]
Size: 15-25 mm. **Notes**: elytral coloration variable, from all yellow-orange to all black, but striate elytral sculpturing very distinctive.

226. ***Tetrops praeusta*** Linnaeus [p. 148]
Size: 4-6 mm. **Notes**: very small, cylindrical, with black body and black-tipped pale orange-brown elytra.

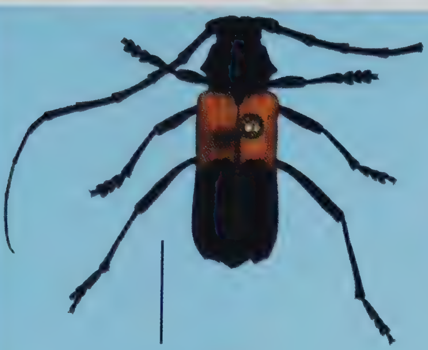
227. ***Ancylocera bicolor*** (Olivier), male [p. 125]
Size: 8-13 mm. **Notes**: very distinctive appearance, with black, elongated, cylindrical pronotum almost as long as the bright red body. The males have very long, slender antennae, as shown, but the females have the antennae much shorter than body, segments broadened somewhat.

228. ***Elytroleptus floridanus*** (LeConte) [p. 127]
Size: 8-11 mm. **Notes**: edges of elytra turned under, strong ridges on dorsal surface. Distinctive sculpturing and pattern of orange markings make this species greatly resemble lycid beetles.

229. ***Hemierana marginata ardens*** (LeConte) [p. 148]
Size: 6-11 mm. **Notes**: This subspecies is a mimic of lycid beetles, with fringed antennae. Resembles *Eupogonius subarmatus*, but the antennal scape is thicker, there are no lateral pronotal projections, and the orange markings sometimes extend onto the humeri.

230. ***Eupogonius subarmatus*** (LeConte) [p. 131]
Size: 6-8 mm. **Notes**: pronotum black with two yellowish stripes, resembling a lycid beetle. Most likely to be confused with *Hemierana marginata*, but the pronotal stripes never continue onto the elytra, there are small but distinct lateral pronotal spines, and the basal antennal segments are much smaller.

231. ***Lycochoriolaus lateralis*** (Olivier) [p. 36]
Size: 7-11 mm. **Notes**: a small, slender species, the one mimic of lycid beetles among NE lepturines (easily distinguished from those in other subfamilies by its head and prothorax), with markings developed to varying degrees, but generally as shown.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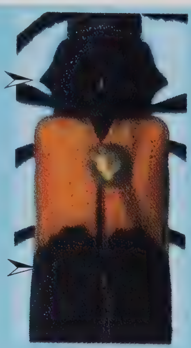
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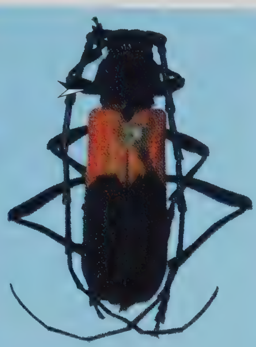
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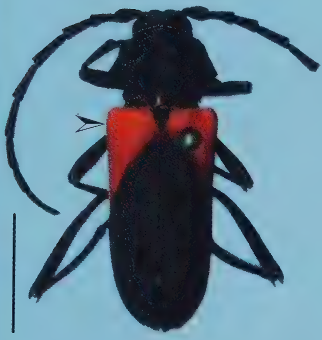
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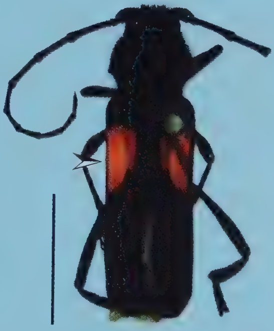
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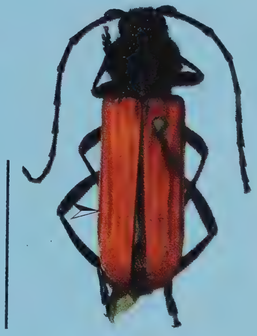
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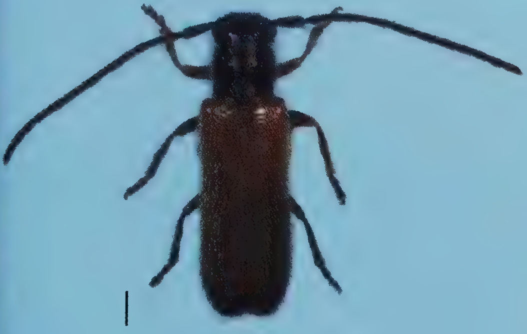
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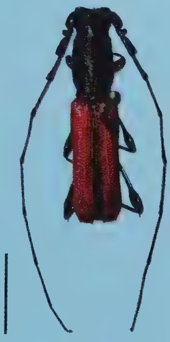
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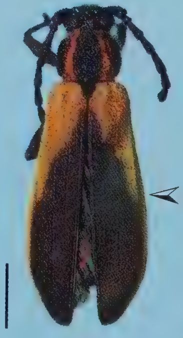
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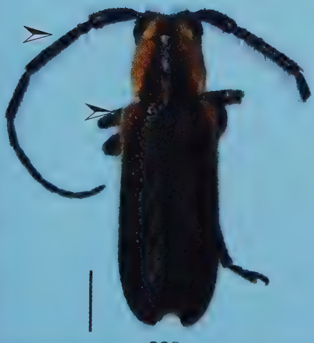
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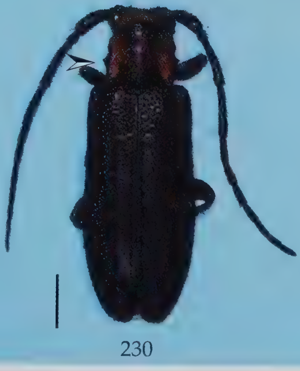
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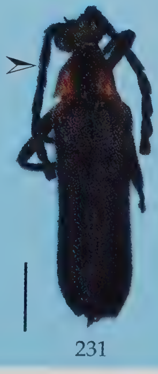
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PLATE 20: Figures 232-241

232. ***Tetraopes pilosus*** Chemsak [p. 147]
Size: 11-17 mm. **Notes**: body surface including callus completely obscured by dense whitish or yellowish-gray pubescence.

233. ***Tetraopes annulatus*** LeConte [p. 147]
Size: 8-16 mm. **Notes**: very similar to preceding species, but more gray pubescent, with a broad, weakly prominent glabrous mid-pronotal callus and relatively wide pale antennal rings; the elytral tips are often darkened.

234. ***Tetraopes texanus*** Horn [p. 148]
Size: 11-17 mm. **Notes**: The antennae, with their long tufts of dark hair (grouped together at the tip of each segment, as opposed to the usual shorter fringe hairs seen in other species such as *T. femoratus*) and unusual curved, elongate tips, are very distinctive.

235. ***Tetraopes femoratus*** LeConte [p. 147]
Size: 8-19 mm. **Notes**: best distinguished from other species by its mid-pronotal callus, which is elongate and flat-topped with abrupt and almost parallel lateral edges.

236. ***Tetraopes tetrophthalmus*** (Forster), a = male, b = female [p. 148] "Red Milkweed Beetle"
Size: 8-15 mm. **Notes**: The combination of broad, disc-like pronotal callus, unringed antennae, and strong elytral spots (subhumeral spots present and often quite large) distinguish this species.

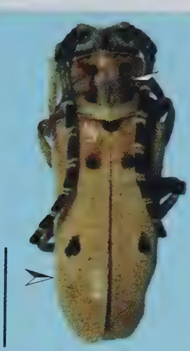
237. ***Tetraopes melanurus*** Schönherr, a = male, b = female [p. 147]
Size: 7-12 mm. **Notes**: pronotum with very weak medial callus, elytra with distinctive broad dark markings in addition to spots, at least apically and typically medially; antennae entirely dark, unringed.

238. ***Tetraopes discoideus*** LeConte [p. 147]
Size: 5-10 mm. **Notes**: similar to preceding, but smaller, with dark pronotum, the pronotal callus fairly well-defined and pubescent, and dark markings on the otherwise red head.

239. ***Tetraopes quinquemaculatus*** Haldeman [p. 147-148]
Size: 8-12 mm. **Notes**: separated from most other species by having elytra without basal spots; since it typically has slight dark markings at the elytral tips, it can be confused with unusually pale *T. melanurus* forms, but is separated by the slightly ringed antennae, the smaller posterior spots, and the dark humeral spots are sometimes lacking in *melanurus*.

240. ***Phaea canescens*** (LeConte) [p. 146]
Size: 9-12 mm. **Notes**: head and pronotum orange with dark, hairy, mid-pronotal callus, elytra with dense gray pubescence, slightly larger and more robust than following species.

241. ***Phaea monostigma*** (Haldeman) [p. 147]
Size: 7-10 mm. **Notes**: head and pronotum reddish, callus variably darkened, elytra with black pubescence, slightly smaller and more slender than preceding species.



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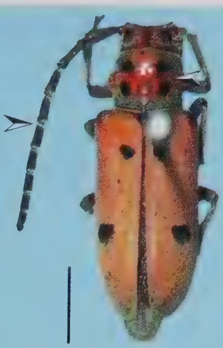

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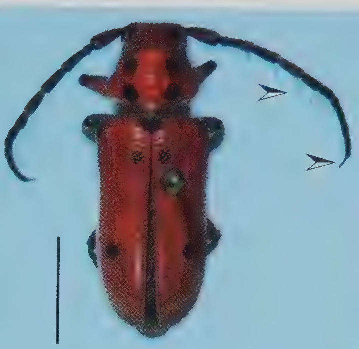

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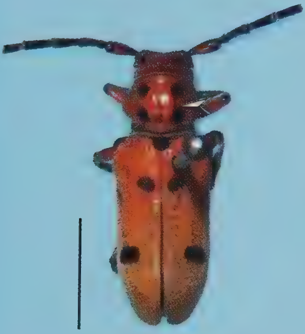

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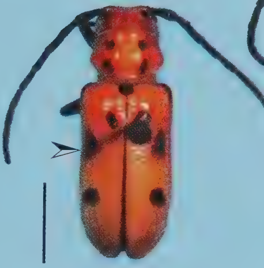

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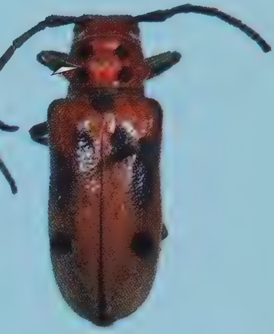

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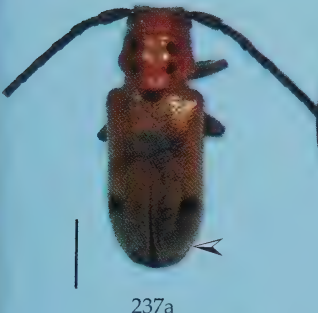

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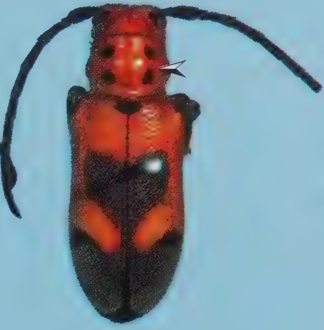

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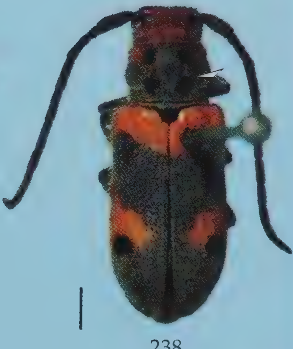

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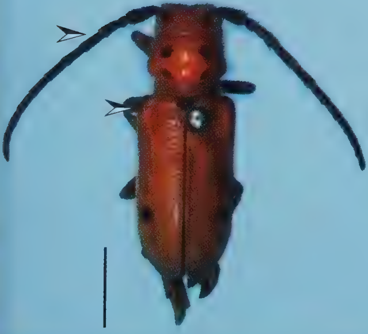

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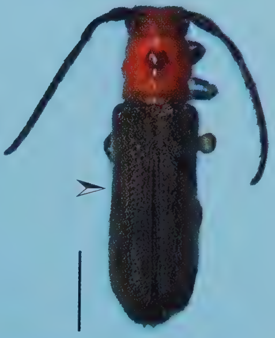

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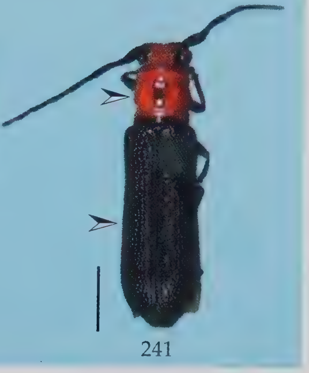

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PLATE 21: Figures 242-251

242. ***Oberea ruficollis*** (Fabricius) [p. 145] "Sassafras Borer"
Size: 15-21 mm. **Notes**: distinctively colored with body, head, and prothorax reddish-orange, including four pronotal calli (pale and punctate instead of dark and shining), and gray elytra.

243. ***Oberea erythrocephala*** (Fabricius) [p. 142-143]
Size: 9-11 mm. **Notes**: generally dark gray (including pronotum) with yellow-orange legs and reddish head, a few reddish marks ventrally, no pronotal calli. Elytral and pronotal pubescence dense, obvious.

244. ***Oberea oculaticollis*** (Say) [p. 144]
Size: 9-13 mm. **Notes**: The entirely dark body with dense silvery-gray pubescence and dark appendages is distinctive. The antennae and elytra rarely may tend towards brownish coloration distally.

245. ***Oberea caseyi*** Plavilstshikov, male [p. 141-142]
Size: 9-12 mm. **Notes**: The body is largely yellowish to reddish, with dark antennae, and four pronotal calli. May resemble lighter forms of *O. pruinosa* (in which, if the humeri are dark, the midline at the base is also dark). However, individuals of *caseyi* (and *schaumii*) have more slender femora than *pruinosa*, and the pronotum is narrower at the front than at the base (broadest in the middle), with less appressed pubescence and smaller posterior spots. Sometimes the humeral markings extend to form lateral stripes (Fig. 245b). See synopses for details.

246. ***Oberea pruinosa*** Casey, a & c = female, b = male [p. 145]
Size: 10-16 mm. **Notes**: markings generally as in Fig. 246a, but the elytral markings rarely are elongated and expanded to form stripes, or fusing so almost the entire elytral surface is dark (Fig. 246b), or reduced similar to *caseyi*. Recognized best by the broad femora, with a thick covering of pubescence, while the pronotum is as broad at the front (forming a "collar") as at the base and pubescent, the posterior pronotal spots are large, and the head in both sexes is relatively broad and hairy. The first two or three abdominal sternites are almost entirely dark, and the abdominal apices are quite different, with the swelling on the female pygidium produced into a very strongly projecting, tapering cone (Fig. 246c). See synopses for details.

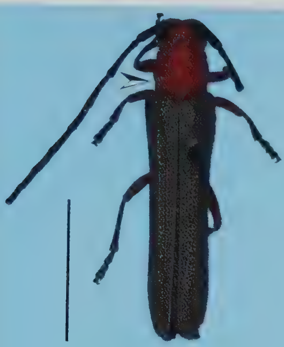
247. ***Oberea schaumii*** LeConte, female [p. 145] "Poplar Branch Borer"
Size: 8-17 mm. **Notes**: typical coloration as in Fig. 247a, and sometimes some faint pale dorsal stripes as in Fig. 247b. The posterior pronotal spots are smaller than in *pruinosa*, and occasionally individuals also have the head darkened. The abdomen is typically entirely pale or reddish beneath. Other differences between this and *pruinosa* are discussed above and in the synopses.

248. ***Oberea gracilis*** (Fabricius) [p. 143] "Oak-sprout Oberea"
Size: 10-15 mm. **Notes**: orange pronotum without calli and orange elytra with well-defined dark lateral stripes and distinct punctures.

249. ***Oberea pallida*** Casey [p. 144]
Size: 10-14 mm. **Notes**: entire body, including appendages, usually rusty yellowish to reddish-brown, though often the pronotal calli, antennal scape, and some sternites are slightly darkened (rarely black). The elytra, including humeri, always lack dark markings, and tend to have more acute outer apices than other species.

250. ***Oberea affinis*** Leng & Hamilton [p. 141]
Size: 10-16 mm. **Notes**: a rather dark species, similar to *O. perspicillata*, but the two pronotal calli are usually pale, while there is a dark basal spot and a broad dark triangle on the side, running from the foreleg bases to the back of the head; for those few specimens with dark pronotal calli, further diagnostic features are that the hairs on the body and elytra are dark, and the last male sternite is more deeply concave with a strongly emarginate posterior margin. See synopses for details.

251. ***Oberea perspicillata*** Haldeman [p. 144] "Raspberry Cane Borer"
Size: 8-15 mm. **Notes**: almost completely black, with the pronotum orange except for the two black calli, a basal black margin (occasionally reduced to a spot as in *O. affinis*), and a small lateral mark near the foreleg bases. Occasional specimens have the legs and apical antennal segments brown (or partially yellowish), and with weak yellowish markings at the elytral bases and epipleural margins. See synopses for details.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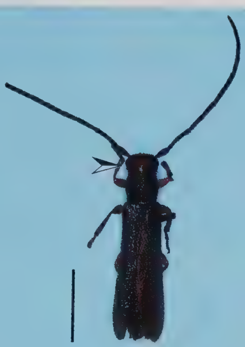
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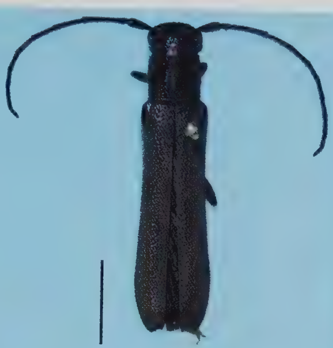
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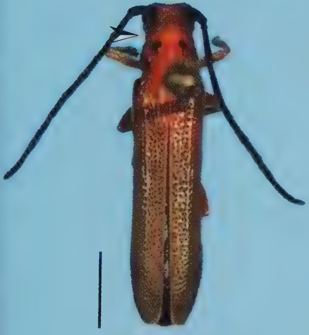
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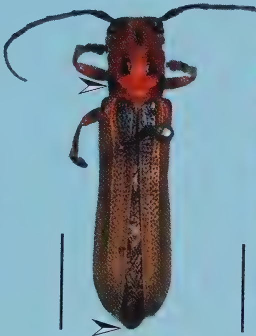
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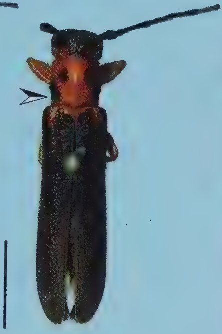
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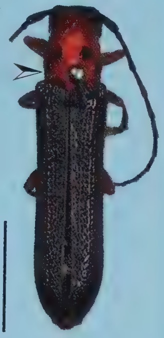
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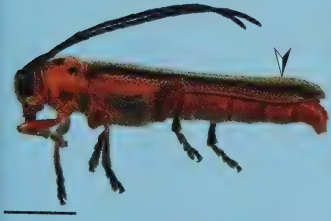
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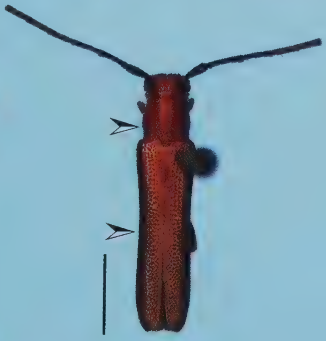
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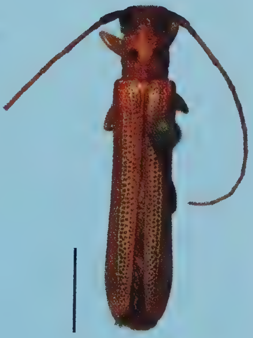
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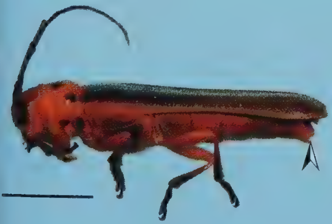
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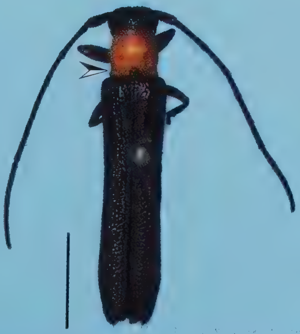
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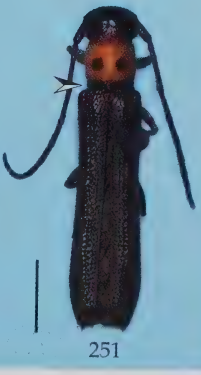
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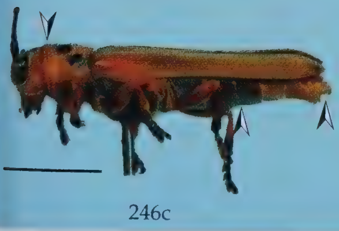
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PLATE 22: Figures 252-259

252. ***Oberea tripunctata*** (Swederus), a & c = male, b, d, e = female [p. 146] "Dogwood Twig Borer"
Size: 8-13 mm. **Notes**: many color variants, all with the mandibles relatively elongated, outer margin rather straight, abruptly incurving very near the apex (Fig. 252b), whereas all other similar species have the mandibles broader, with the outer margin evenly curved. Always has a dark scutellum, the legs are pale, and at least the apical antennal segments banded. The underside of the body, including prothorax, is almost competely dark (Fig. 252e). See synopses for details.

253. ***Oberea flavipes*** Haldeman [p. 143]
Size: 7-11 mm. **Notes**: The combination of entirely dark head, antennae, thorax, and body with yellow legs (elytra dark brownish) makes this slender species distinctive (but see above). Occasionally the epipleura are yellowish.

254. ***Oberea delongi*** Knull [p. 142] "Poplar Twig Borer"
Size: 7-13 mm. **Notes**: mostly black, but pronotum yellow-orange anteriorly (at least ventrally), with variable amount of black at middle dorsally and at base; yellow-orange legs and head (sometimes dark on vertex), abdomen dark with yellow apex, epipleural margin briefly yellow. Elytral and pronotal pubescence weak.

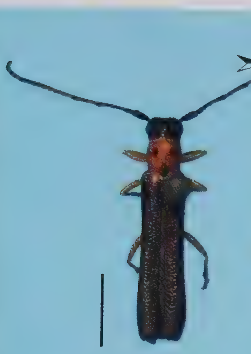
255. ***Oberea ocellata*** Haldeman [p. 143] "Sumac Stem Borer"
Size: 11-17 mm. **Notes**: recognized by reddish head (never entirely dark), thorax, body, and femora; the legs are distally darkened, and the elytra are covered with fine gray pubescence. Coastal and southeastern specimens may have the upper surfaces of the head and thorax darkened. Best separated from *O. ulmicola* by the slightly broader form, darker antennae, elytra, tibiae and tarsi, smaller lower eye lobes, and reddish head. See synopses for details.

256. ***Oberea ulmicola*** Chittenden, a = male, b = female [p. 146]
Size: 9-14 mm. **Notes**: has most or all of the head dark, pronotum often with a dark median basal spot or ventral spot, elytra generally dark with some pale areas basally, scutellum and legs pale, antennae dark at the base, typically becoming gradually paler, and the underside of the body largely or entirely pale (metepisternum *never* black, though sometimes there is darkening of ventral metasternum and/or sternites 2 and 3 as in Fig. 256b). See synopses for details.

257. ***Oberea myops*** Haldeman, male [p. 143] "Rhododendron Stem Borer"
Size: 9-18 mm. **Notes**: body mostly pale, elytra pale but darkened laterally, antennae entirely dark (rarely paler apically), metepisternum always dark, but metasternum usually pale ventrally, and legs distally darkened, especially hind legs. Best separated from *O. deficiens* by the lack of a ventral pronotal spot, also the darker legs and antennae. The concavity of the last male sternite is deep and nearly hemispherical rather than heart-shaped. See synopses for details.

258. ***Oberea praelonga*** Casey, female [p. 144-145]
Size: 8-16 mm. **Notes**: has much or all of the head dark, with a darkened median basal pronotal spot, pale scutellum, legs usually pale but sometimes slightly darkened distally, metepisternum always black, metasternum usually dark ventrally, final sternite largely black (Fig. 258b). The elytra vary from almost entirely pale to dark with weak pale stripes. See synopses for details.

259. ***Oberea deficiens*** Casey, a = male, b = female [p. 142]
Size: 10-14 mm. **Notes**: almost entirely yellowish, with a darkened median basal pronotal spot (occasionally absent), pale scutellum and legs, dark spots above the forecoxae (always absent in *myops*), metepisternum always black, but metasternum often pale ventrally, final sternite pale. The antennae are dark at the base and gradually become lighter (rarely with the apical segments banded). The heart-shaped concavity on the final male sternite of this species is quite different from the almost hemispherical one seen in *myops*. See synopses for details.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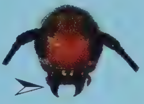
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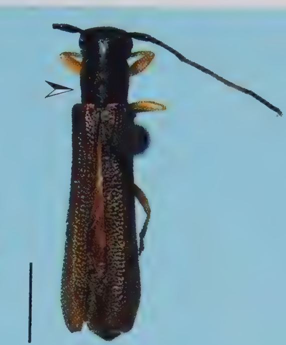
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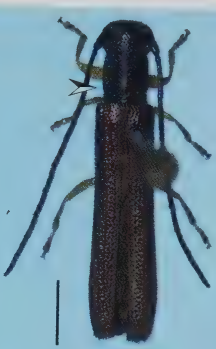
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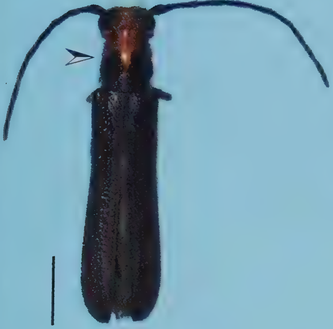
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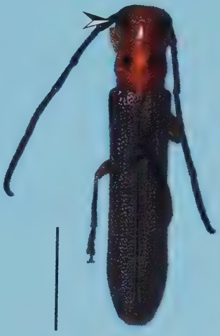
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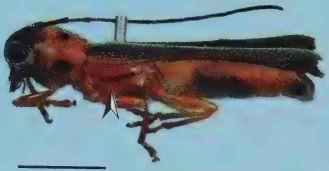
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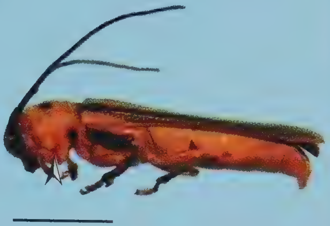
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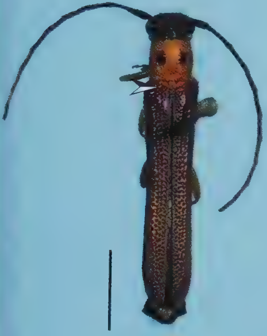
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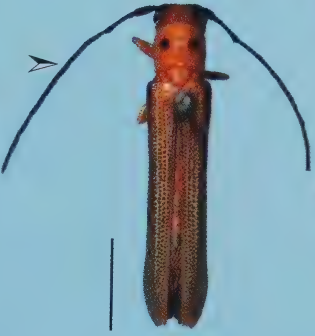
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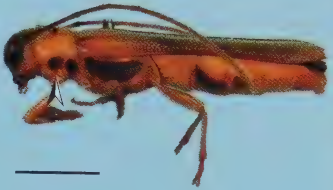
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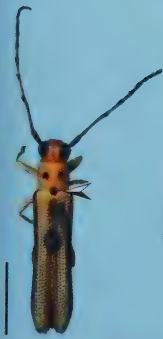
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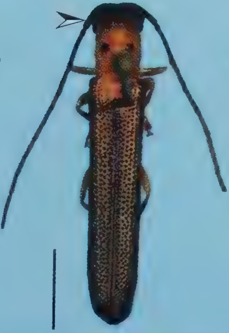
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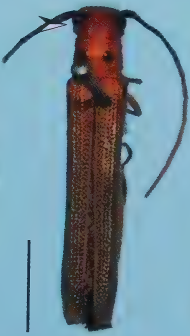
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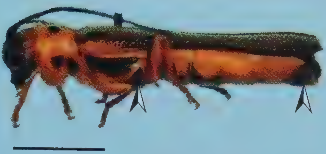
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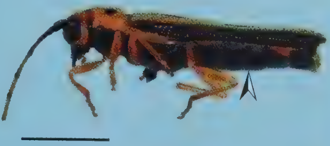
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PLATE 23: Figures 260-269

260. ***Hippopsis lemniscata*** (Fabricius) [p. 133]
Size: 7-15 mm. **Notes**: extremely slender striped body and cone-like head with very long antennae distinctive among NE longhorns.

261. ***Dorcasta cinerea*** Horn [p. 130]
Size: 6-11 mm. **Notes**: The elongate form, with banded, fringed antennae and pointed elytra with long scattered hairs arising from black punctures make this species distinctive.

262. ***Saperda mutica*** Say [p. 140]
Size: 11-17 mm. **Notes**: This somewhat uncommon species has coloration unique among NE longhorns.

263. ***Saperda calcarata*** Say, a = female, b = male [p. 139] "Poplar Borer"
Size: 18-33 mm. **Notes**: largest species in the genus, and has distinct spines at the elytral tips. The coloration is quite variable but unique, usually in pastel hues.

264. ***Saperda vestita*** Say, a = female, b-c = male [p. 141] "Linden Borer"
Size: 11-23 mm. **Notes**: varies from largely light olive brown to grayish, with small black median spots which may fuse, or vanish entirely (Fig. 264c). Even gray, unmarked individuals may be separated from *S. inornata* by the pale antennae, and long white hairs on antennae and elytral tips.

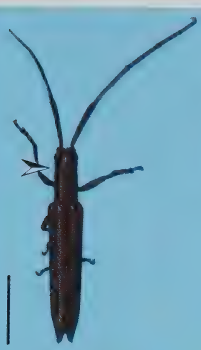
265. ***Eupogonius pubescens*** LeConte [p. 131]
Size: 5-9 mm. **Notes**: pronotal projections weak, blunt, elytra smoothly but not densely gray pubescent. Best separated from unusually small specimens of *Saperda inornata* by the small lateral projections and weak median stripe of the pronotum.

266. ***Saperda inornata*** Say [p. 139-140] "Poplar-Gall Saperda"
Size: 8-13 mm. **Notes**: uniformly gray pubescence has led to confusion with following two species, but *Mecas* species have tarsal claws distinctly toothed and thicker antennae. Also, *S. inornata* typically has vague lateral stripes of thickened pubescence on the narrower pronotum. See synopses for details.

267. ***Mecas cineracea*** Casey [p. 141]
Size: 6-11 mm. **Notes**: small species with uniformly pale pubescence; this and the following species are further distinguished from *S. inornata* by toothed tarsal claws, visibly thicker antennae, and broader prothorax.

268. ***Mecas cana saturnina*** (LeConte) [p. 141]
Size: 9-16 mm. **Notes**: uniformly gray, has often been confused with *Saperda inornata*, but has two dark spots on pronotum.

269. ***Mecas pergrata*** (Say) [p. 141]
Size: 6-12 mm. **Notes**: The five small, shining spots on pronotum, reddish femora, and gray elytra with narrow yellowish margins make this species easily recognized.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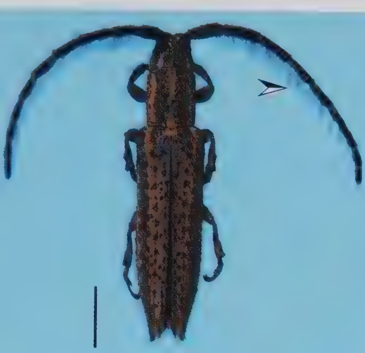
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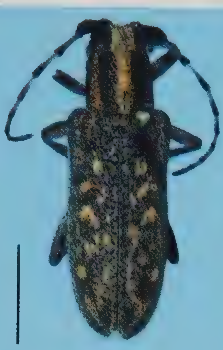
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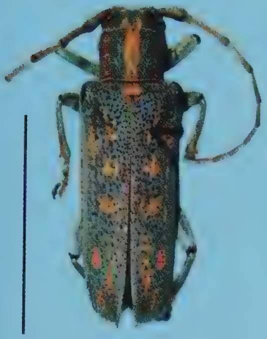
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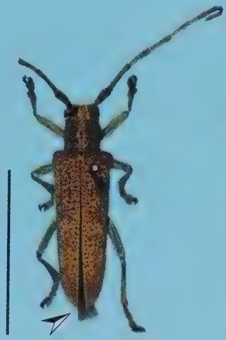
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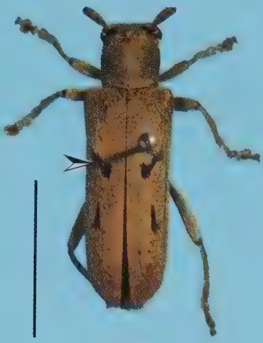
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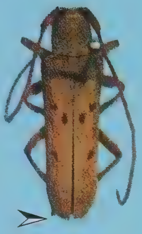
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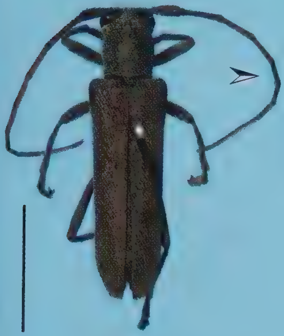
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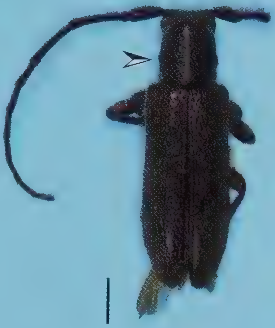
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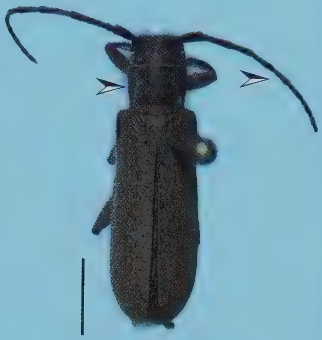
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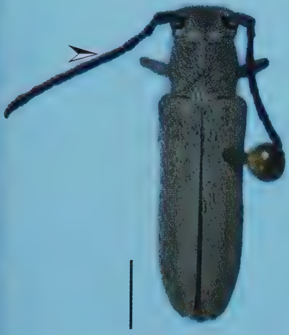
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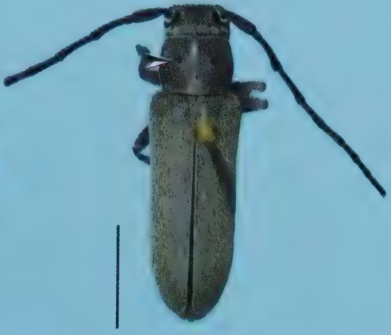
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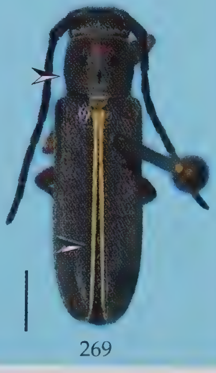
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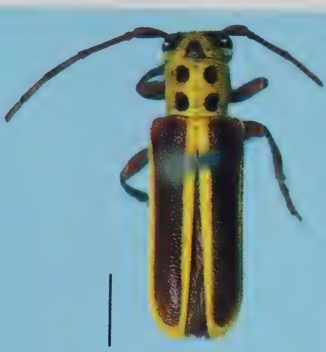
PLATE 24: Figures 270-279

270. ***Saperda puncticollis*** Say [p. 140] "Woodbine Borer"
Size: 8-12 mm. **Notes**: four black spots on yellow pronotum, yellow-margined elytra.
271. ***Saperda lateralis*** Fabricius [p. 140] "Red-edged Saperda"
Size: 9-14 mm. **Notes**: another mimic of lycid beetles, with orange longitudinal stripes on a dark body. Sometimes there are cross-stripes, as shown, but the uniformly dark, deeply punctate elytra make these individuals distinctive from both *S. imitans* and *S. tridentata*.
272. ***Saperda tridentata*** Olivier, a & c = male, b = female [p. 140] "Elm Borer"
Size: 8-17 mm. **Notes**: the generally distinctive markings of this species may be reduced (as in Fig. 272a), but the first elytral band is always transverse and sinuate, and there are almost always basal and apical dark spots in addition to the bands, distinguishing it from both *S. imitans* and *S. lateralis*.
273. ***Saperda imitans*** Felt & Joutel [p. 139]
Size: 10-16 mm. **Notes**: similar to the more common *S. tridentata*, but lacks dark elytral spots, and always has an oblique first band at elytral bases rather than sinuately transverse; the lighter, smooth powdery gray surface distinguish it from well-marked forms of *S. lateralis*.
274. ***Saperda obliqua*** Say [p. 140] "Alder Borer"
Size: 14-19 mm. **Notes**: distinctive brown elytra with oblique depressions, numerous punctures, and strong spines at tips.
275. ***Saperda discoidea*** Fabricius, a = male, b = female [p. 139] "Hickory Saperda"
Size: 9-17 mm. **Notes**: dimorphic, with very different coloration of the sexes; males have grayish, punctate elytra, pale reddish legs, and striped pronotum, while the females are distinctively brownish with irregular paler patches on the elytra and a paler pronotum.
276. ***Saperda populnea moesta*** LeConte, a = male, b = female [p. 140] "Eastern Gall Saperda"
Size: 8-11 mm. **Notes**: elytra black with coarse, deep punctures and grayish hairs, females with lateral pronotal stripes.
277. ***Saperda fayi*** Bland, a = male, b = female [p. 139] "Thorn-limb Borer"
Size: 9-15 mm. **Notes**: similar to *S. cretata*, the smaller, more slender form and different markings (often quite reduced in the males) make it easily recognized.
278. ***Saperda cretata*** Newman [p. 139] "Spotted Apple Tree Borer"
Size: 15-21 mm. **Notes**: resembles a larger version of *S. fayi*, but the white markings are larger and shaped differently. The underside is brown with white along the sides.
279. ***Saperda candida*** Fabricius [p. 139] "Round-headed Apple Tree Borer"
Size: 10-21 mm. **Notes**: one of our most distinctive longhorns, the elytral stripes are sometimes briefly interrupted, but the completely white underside makes this species easily recognizable.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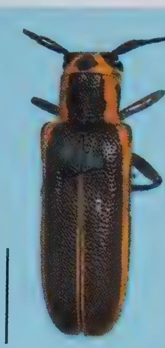
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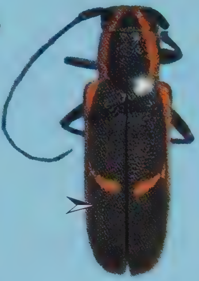
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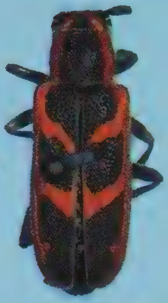
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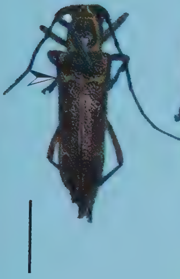
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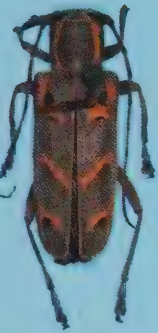
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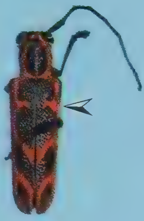
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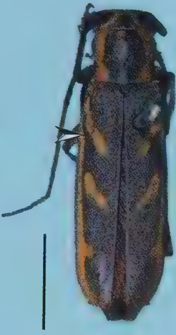
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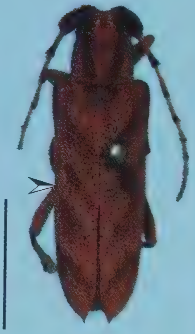
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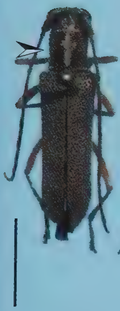
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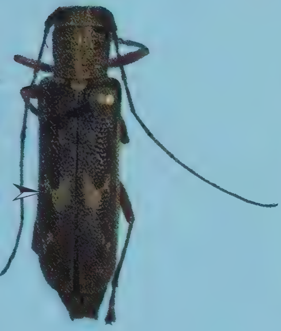
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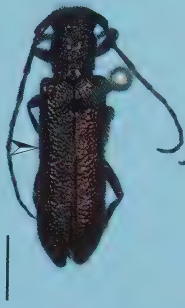
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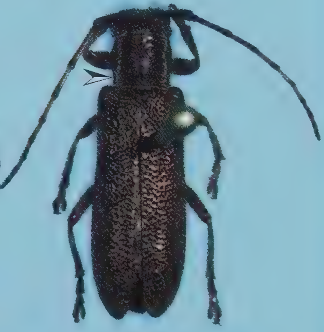
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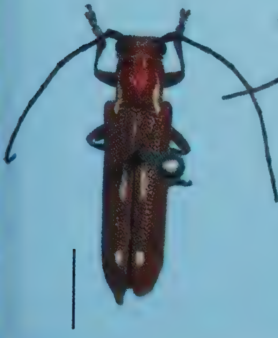
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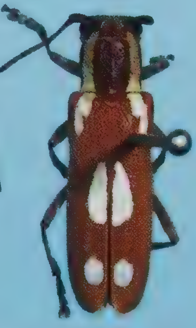
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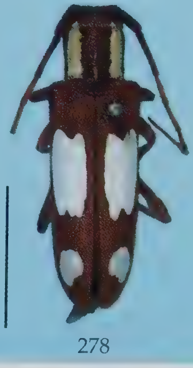
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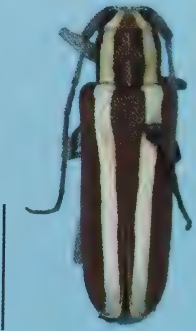
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PLATE 25: Figures 280-291

280. ***Lypsimena fuscata*** LeConte [p. 132]
Size: 6-9 mm. **Notes**: elongate body shape, very long antennae, and elytra distinctively marked with weak irregular brownish/whitish stripes.

281. ***Ataxia crypta*** (Say) [p. 131]
Size: 12-18 mm. **Notes**: distinguished from following two species by broadly, obliquely truncate elytral tips, metasternum with very deep medial groove, and antennal scape with angled, shelflike apex.

282. ***Ataxia brunnea*** Champlain & Knull [p. 130]
Size: 10-12 mm. **Notes**: similar to *A. hubbardi*, but pubescence is uniformly reddish-brown, without whitish tufts, and the elytral tips are more rounded.

283. ***Ataxia hubbardi*** Fisher [p. 131]
Size: 10-16 mm. **Notes**: mottled pubescence as in *A. crypta*, though a bit more visibly arranged in stripes; the more pointed elytral tips and very shallow metasternal groove further distinguish it.

284. ***Atimia c. confusa*** (Say) [p. 44-45] "Small Cedar-bark Borer"
Size: 6-9 mm. **Notes**: resembles a small lamiine, but markings and shape are quite distinctive.

285. ***Pogonocherus penicillatus*** LeConte [p. 132]
Size: 4-6 mm. **Notes**: pubescence distinctive; elytra with angled white basal band, four or five discrete tufts of black setae along median ridges.

286. ***Pogonocherus parvulus*** LeConte [p. 132]
Size: 4-6 mm. **Notes**: markings may resemble those of following species, but elytra without erect hairs, pronotal calli somewhat dull, with blunt spines.

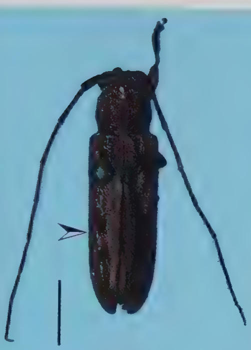
287. ***Pogonocherus mixtus*** Haldeman [p. 132]
Size: 4-6 mm. **Notes**: variable in coloration, but easily separated from the preceding by the pronotum with acute lateral spines and shining dorsal calli, and elytra with erect, black scattered hairs covering the surface.

288. ***Eupogonius tomentosus*** (Haldeman) [p. 131]
Size: 5-10 mm. **Notes**: similar to the following, but body reddish-brown, elytra with small irregular patches of appressed pubescence, leaving large shining areas over most of the surface, and with thin black erect hairs.

289. ***Eupogonius pauper*** LeConte [p. 131]
Size: 6-11 mm. **Notes**: elytral pubescence very irregular but covering much of the surface, unlike the somewhat similar and more reddish *E. tomentosus*. Coloration varies among populations on different host plants.

290. ***Oplosia nubila*** (LeConte) [p. 133]
Size: 9-14 mm. **Notes**: The combination of shape and finely-mottled pattern of white and brown pubescence on otherwise slightly shining, finely-grooved elytra makes this species distinctive.

291. ***Ecyrus d. dasycerus*** (Say) [p. 132]
Size: 4-10 mm. **Notes**: variable in size, and darker and lighter variants occur, but the combination of body shape and the dark, inverted arc-like marking at the elytral base is distinctive (though the mark is sometimes faint, as in the individual shown).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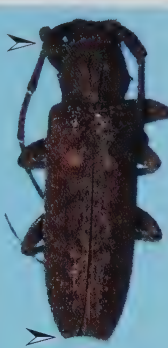
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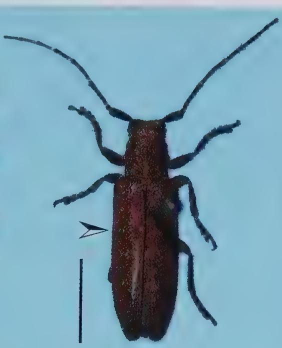
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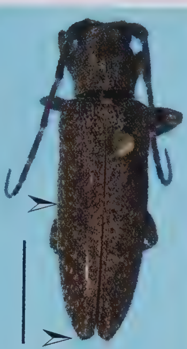
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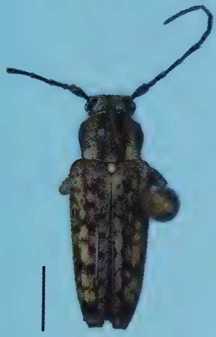
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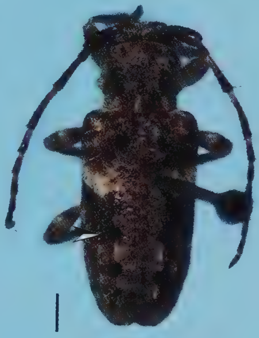
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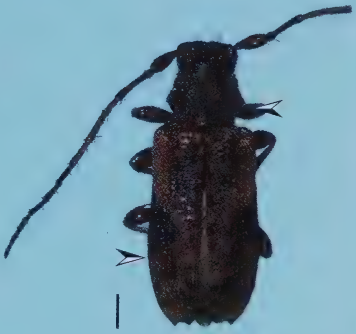
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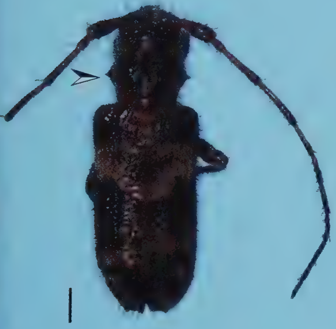
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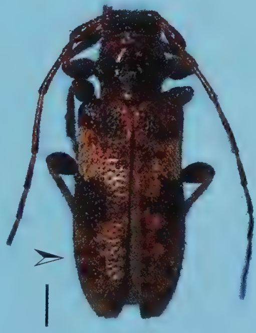
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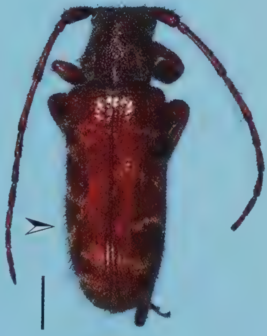
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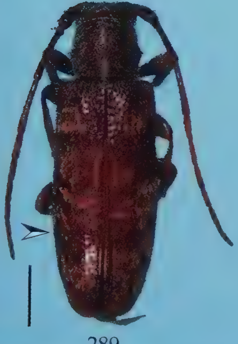
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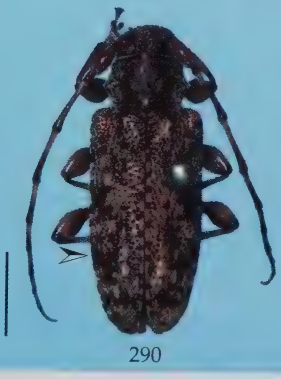
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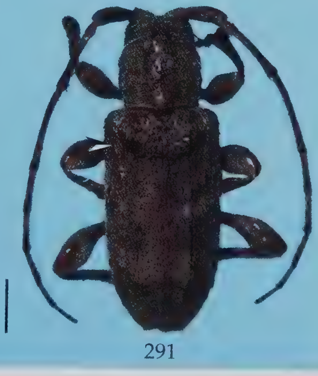
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PLATE 26: Figures 292-302

292. ***Leptostylus transversus*** (Gyllenhal) [p. 136]
Size: 6-14 mm. **Notes**: somewhat variable in size and appearance, but the general dark, rough, mottled pattern with transverse subapical light markings is distinctive.

293. ***Leptostylus asperatus*** (Haldeman) [p. 135-136]
Size: 9-13 mm. **Notes**: separated from the preceding species by spines at leg bases (trochanters), elytra largely whitish, in strong contrast to darker areas.

294. ***Styloleptus biustus*** (LeConte) [p. 137-138]
Size: 4-9 mm. **Notes**: similar to *Liopinus* at first glance, but readily distinguished by the rounded, rather than pointed, pronotal edges. The small size and the shape of the pronotum also separates this from *Leptostylopsis* or *Leptostylus*. The extent of dark markings is variable, at least lateral areas dark, but sometimes also strong markings along dorsal midline (somewhat as in Fig. 309d).

295. ***Leptostylopsis planidorsus*** (LeConte) [p. 135]
Size: 8-14 mm. **Notes**: This species has several weak dorsal pronotal tubercles, coloration variable but rather distinctive; tarsi entirely dark, pronotum almost uniformly pale, elytra with broad oblique pale areas (often an "X" or inverted "V" shape), and dark oblique marks apically, with tiny scattered black tufts.

296. ***Astylopsis arcuata*** (LeConte) [p. 134]
Size: 7-13 mm. **Notes**: elytra variably marked dorsally (generally with much reduced dark markings relative to other species in genus), often with oblique posterior bands, but always with distinctive dark epipleural margins.

297. ***Astylopsis sexguttata*** (Say) [p. 134]
Size: 6-11 mm. **Notes**: very similar to the following, but black markings scattered on surface of elytra are actually small hair tufts, easily visible from side as tiny bumps.

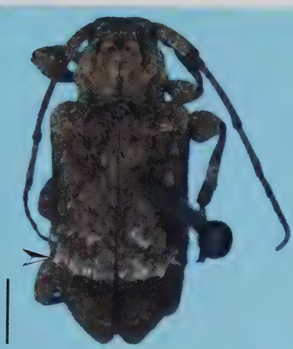
298. ***Astylopsis collaris*** (Haldeman) [p. 134]
Size: 6-11 mm. **Notes**: This species tends to have more mottled elytra than *A. arcuata*, with well-defined dark markings in the form of pronotal stripes and subhumeral dark spots, and without the well-defined light markings of *A. macula*.

299. ***Astylopsis macula*** (Say) [p. 134]
Size: 6-9 mm. **Notes**: similar to the preceding, but with pronotum white at sides and darker along midline between black stripes, elytra with transverse triangular whitish marks converging at midline, and variably developed whitish patches posterior to these along midline.

300. ***Aegomorphus modestus*** (Gyllenhal) [p. 133]
Size: 10-16 mm. **Notes**: somewhat variable in coloration, but the combination of "M"-shaped markings on a mottled background and strong lateral pronotal spines are distinctive.

301. ***Aegomorphus morrisii*** (Uhler) [p. 133]
Size: 20-26 mm. **Notes**: large, with small tufts of whitish hair rising from elytral punctures, and strong "M"-shaped black markings on a rather pale background.

302. ***Aegomorphus quadrigibbus*** (Say) [p. 133]
Size: 9-16 mm. **Notes**: elytral bases with distinctive pale markings, color otherwise quite dark and often shining.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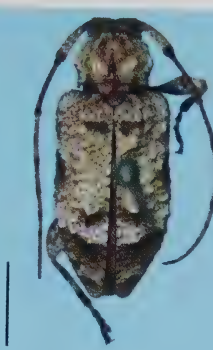
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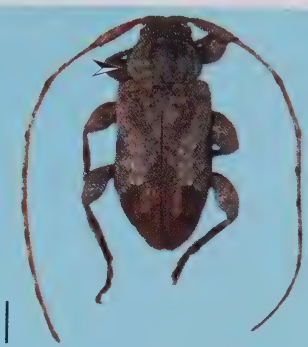
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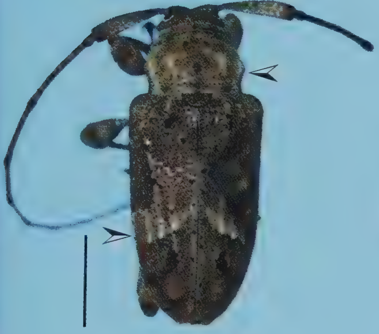
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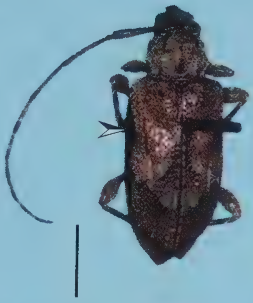
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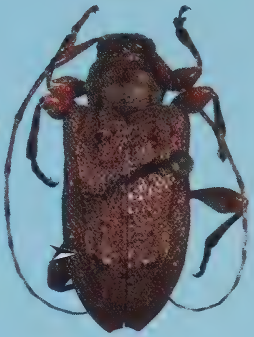
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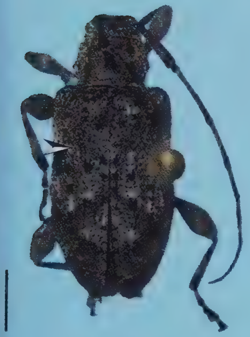
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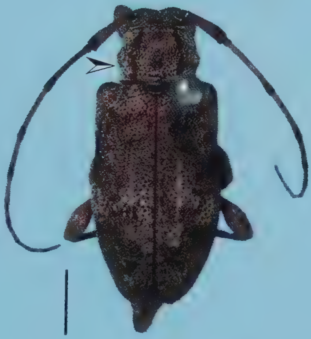
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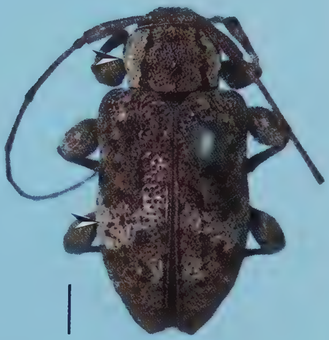
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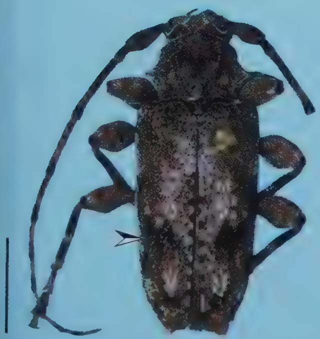
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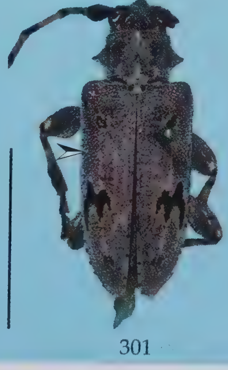
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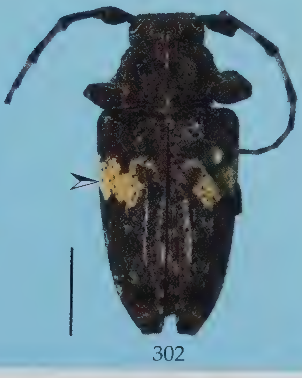
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PLATE 27: Figures 303-311

303. ***Sternidius variegatus*** (Haldeman) [p. 137]
Size: 7-11 mm. **Notes**: somewhat variable coloration, but the spots near the elytral apex, which are dark anteriorly and pale posteriorly, are distinctive.

304. ***Nyssodrysina haldemani*** (LeConte) [p. 137]
Size: 7-10 mm. **Notes**: shape and coloration fairly distinctive; elytral markings somewhat variable, but shape and markings of prothorax uniform and unique, elytral tips sharply angled.

305. ***Astylidius parvus*** (LeConte) [p. 134]
Size: 5-7 mm. **Notes**: This small species is best recognized by the position of the rounded but prominent lateral pronotal tubercles, and the strong dark ridges on the elytral base. There are some forms of *Liopinus* with similar inverted "V"-shaped light elytral markings, but distinguishing features include those above, and also the punctures along the pronotal base are much deeper and larger than those elsewhere.

306. ***Liopinus punctatus*** (Haldeman) [p. 137]
Size: 5-7 mm. **Notes**: mottled coloration over entire body, without discrete lateral stripes (though there tend to be lateral triangular paler areas, as in preceding species), thus relatively easy to separate from *L. alpha*.

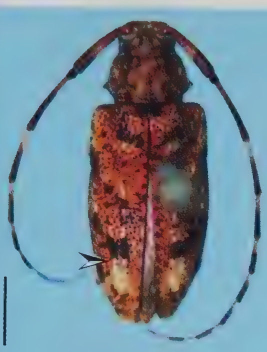
307. ***Liopinus mimeticus*** (Casey) [p. 137]
Size: 5-9 mm. **Notes**: very difficult to separate from *L. alpha* without a microscope (where features such as the shorter tarsal segments and more erect black tufts on elytra would be visible), but slightly broader body, typically paler color, with epipleural markings not extending forward to humeri, and elytral bands slightly less oblique.

308. ***Liopinus misellus*** (LeConte) [p. 137]
Size: 4-7 mm. **Notes**: nearly indistinguishable from some forms of *L. alpha*, differing only in the reduced or absent epipleural markings.

309. ***Liopinus alpha*** (Say) [p. 136-137]
Size: 4-9 mm. **Notes**: probably the most variable color pattern of any NE longhorn, aside from the dark markings on epipleural margins of elytra, which are relatively consistent; these lateral elytral markings are strong, extending forward to humeri. The dorsal elytral bands are strongly oblique, but are sometimes reduced or absent (Fig. 309c), and often there are also whitish patches present (as in Fig. 309b). May well be a complex of closely related species, but there is no consensus presently. See synopses.

310. ***Hyperplatys maculata*** Haldeman [p. 135]
Size: 4-8 mm. **Notes**: elytra are distinctively patterned with black spots, and have a sharp-edged humerus, as in following species; quite variable in appearance, but there are faint pale stripes on the elytra, it almost always has dark epipleural areas (not visible in figure), and always has the large posterior spots.

311. ***Hyperplatys aspersa*** (Say) [p. 135]
Size: 4-10 mm. **Notes**: may be confused with the preceding species, but in particular lacks the dark epipleural areas and pale dorsal stripes, as well as sometimes lacking the large posterior elytral spots.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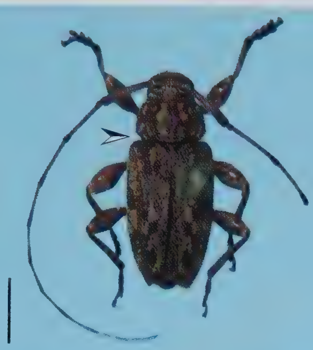
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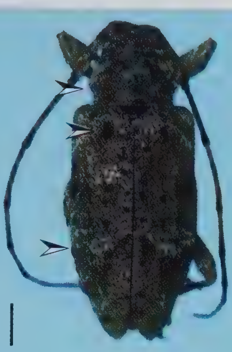
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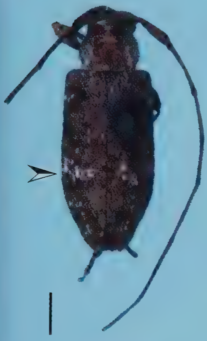
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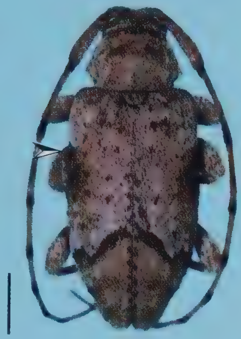
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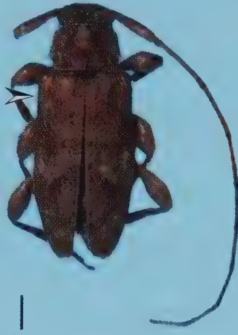
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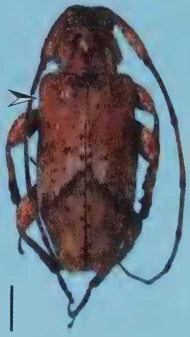
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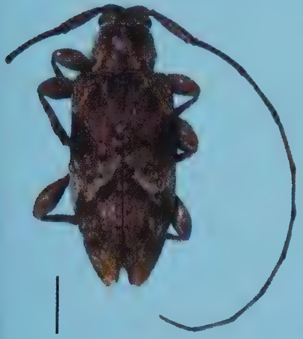
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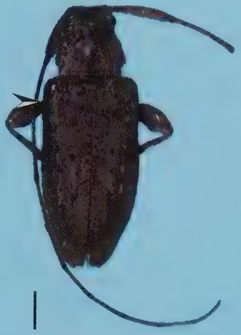
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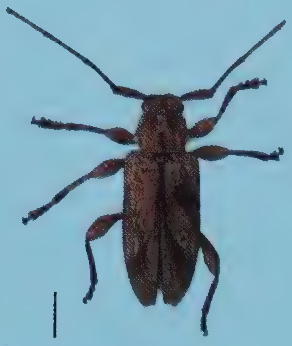
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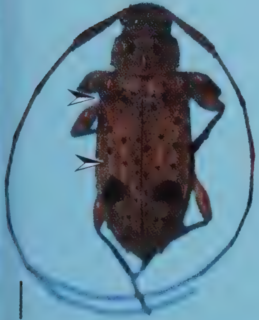
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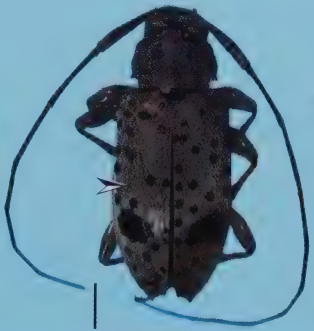
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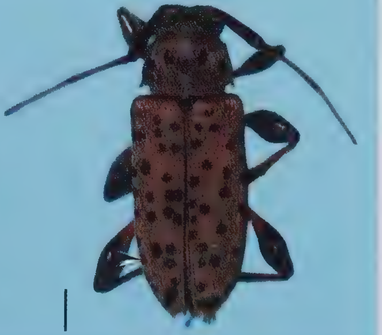
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PLATE 28: Figures 312-323

312. ***Eutrichillus biguttatus*** (LeConte), female [p. 135]
Size: 6-11 mm. **Notes**: somewhat resembles *Urographis*, with a long female pygidium, but the sharp pronotal spine and markings make this species recognizable; the elongate dark spots below the middle of the elytra typically interrupt weak pale lines on an otherwise rather uniform background, though sometimes these markings are poorly defined.

313. ***Acanthocinus pusillus*** Kirby, female [p. 134]
Size: 7-13 mm. **Notes**: body mottled very much as in following species, often slightly more reddish, but tarsi always with light bands (otherwise quite difficult to distinguish). Resembles *Urographis* species in shape and size, but elytra completely lacking erect hairs (also true of following species).

314. ***Acanthocinus obsoletus*** (Olivier), a = male, b = female [p. 133]
Size: 9-17 mm. **Notes**: body mottled in a somewhat variable pattern as in preceding species, but tarsi always entirely dark-haired.

315. ***Urographis triangulifer*** (Haldeman), female [p. 138]
Size: 12-17 mm. **Notes**: generally larger than preceding pair of species, with strong, distinctive markings; dark areas on pronotum, elytral base, and along sides.

316. ***Urographis fasciatus*** (DeGeer), a = female, b = male [p. 138]
Size: 9-15 mm. **Notes**: similar to following species, but darker and more mottled, female with narrower pygidium, male abdominal tip broadly concave, elytral tips also distinctly concave.

317. ***Urographis despectus*** (LeConte), a = male, b = female [p. 138]
Size: 9-14 mm. **Notes**: resembles preceding species but generally paler, with dark subapical markings contrasting, female with slightly broader pygidium, male abdominal tip notched, elytral tips not as concave.

318. ***Acanthocinus nodosus*** (Fabricius), female [p. 133]
Size: 18-27 mm. **Notes**: very distinctive black markings on a gray body, males with a prominent hair tuft at tip of fourth antennal segment.

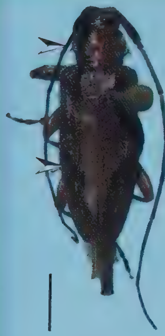
319. ***Lepturges regularis*** (LeConte) [p. 136]
Size: 7-11 mm. **Notes**: very distinctive coloration; pronotum and elytra with large, well-spaced round black spots, antennae yellowish.

320. ***Lepturges angulatus*** (LeConte) [p. 136]
Size: 5-10 mm. **Notes**: similar to following species, but elytral tips slightly angled, dark marks at middle of elytral bases small, lateral markings strongly contrasting with background color.

321. ***Lepturges confluens*** (Haldeman) [p. 136]
Size: 5-10 mm. **Notes**: This fairly common species is similar to and slightly more variable than the preceding species, with elytral tips rounded, dark marks at middle of elytral bases oval, lateral markings often suffused with grayish pubescence, creating a much more variegated appearance.

322. ***Lepturges pictus*** (LeConte) [p. 136]
Size: 8-11 mm. **Notes**: resembles some forms of *L. symmetricus*, but elytra without dark lateral markings connected along epipleural margin, markings strongly contrasting with background color.

323. ***Lepturges symmetricus*** (Haldeman) [p. 136]
Size: 6-9 mm. **Notes**: very similar to *L. pictus*, but a bit more variably marked, elytra with dark lateral markings connected along epipleural margin, markings not so strongly contrasting.



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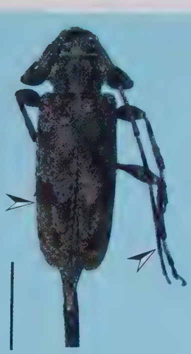

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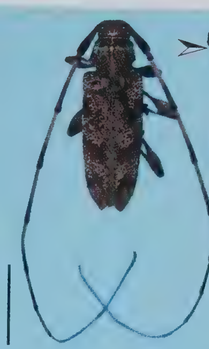

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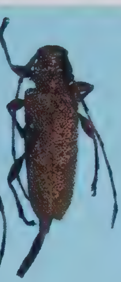

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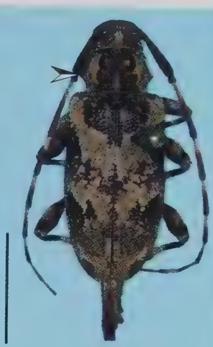

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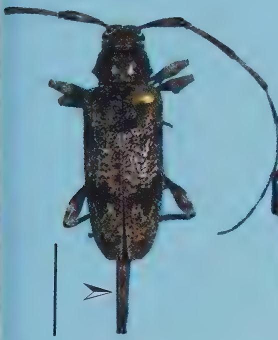

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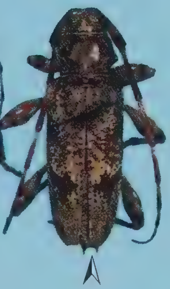

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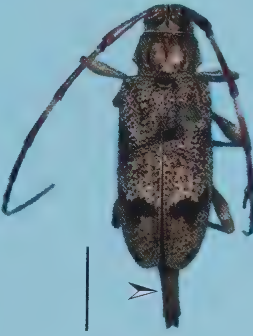

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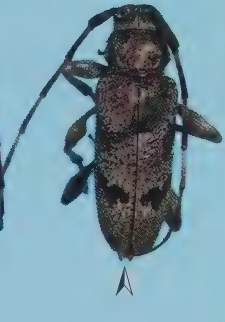

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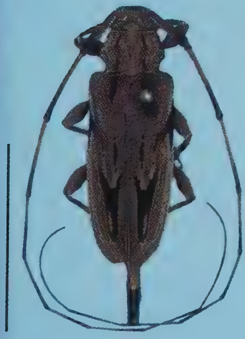

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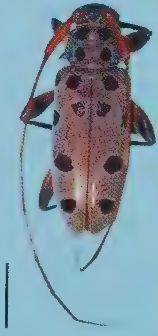

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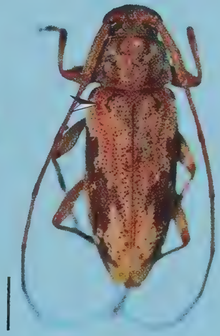

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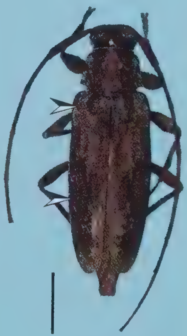

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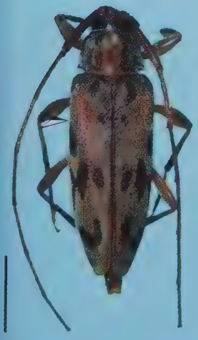

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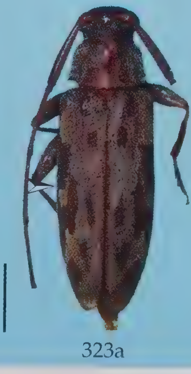

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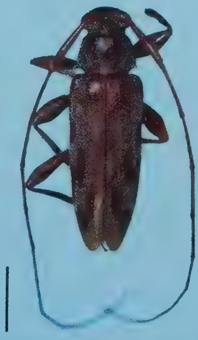

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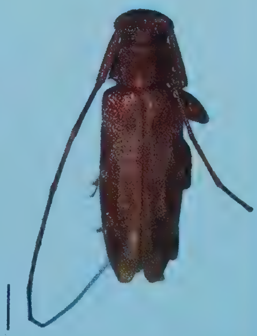

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PLATE 29: Figures 324-336

324. ***Urgleptes signatus*** (LeConte) [p. 138]
Size: 5-8 mm. **Notes**: This species is somewhat less variable than the following, slightly larger on average, markings below middle of elytra narrow, not meeting at midline, and the basal markings commonly form an inverted "U" shape.

325. ***Urgleptes querci*** (Fitch) [p. 138]
Size: 4-6 mm. **Notes**: The elytral pattern of this species is relatively variable, but the markings below middle of elytra are broad, meeting at midline, and the basal markings tend to form a "T" shape along the midline.

326. ***Urgleptes facetus*** (Say) [p. 138]
Size: 3-4 mm. **Notes**: This very small species has the elytra distinctively marked and mostly dark; the broadly dark tips distinguish it from small individuals of *U. querci.*

327. ***Dectes texanus*** LeConte [p. 135]
Size: 5-11 mm. **Notes**: Uniform pubescence and thoracic shape make this genus distinctive, but the two species can be difficult to separate; *texanus* distinguished from following species by markedly shorter second antennal segment, and lower eye lobes roughly equal to facial areas.

328. ***Dectes sayi*** Dillon & Dillon [p. 134-135]
Size: 6-11 mm. **Notes**: has the second antennal segment more elongate than *D. texanus*, and the lower eye lobes are distinctly shorter than the facial area below them.

329. ***Dorcaschema cinereum*** (Olivier) [p. 130]
Size: 8-13 mm. **Notes**: The uniform pale pubsecence with dark central stripe on head and thorax, in combination with the body shape, make this species distinctive.

330. ***Dorcaschema nigrum*** (Say) [p. 130]
Size: 7-12 mm. **Notes**: While shaped similarly to the preceding species, the entirely black coloration makes this species instantly recognizable.

331. ***Dorcaschema wildii*** Uhler [p. 130] "Mulberry Borer"
Size: 15-23 mm. **Notes**: large and distinctive, with white lateral stripes running from the head backwards, and small scattered black spots (concentrated in two lateral circular areas).

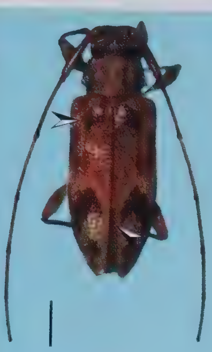
332. ***Dorcaschema alternatum*** (Say) [p. 130] "Small Mulberry Borer"
Size: 7-16 mm. **Notes**: more variable in appearance than other species in genus, but nonetheless distinctive, with the characteristic shape and long antennae of this group, plus strong mottling, yellow-orange striping, and large lateral dark patches on the elytra.

333. ***Microgoes oculatus*** (LeConte) [p. 128]
Size: 8-15 mm. **Notes**: The strong "eyespots" on a grizzled background make the elytral pattern of this species quite distinctive.

334. ***Oncideres c. cingulata*** (Say) [p. 132] "Twig Girdler"
Size: 11-20 mm. **Notes**: This faintly spotted species, with slightly paler medial band, is somewhat reminiscent of a *Goes* species, but has a very broad head, no pronotal tubercles, and slender antennal bases.

335. ***Goes pulverulentus*** (Haldeman) [p. 127] "Living-beech Borer"
Size: 18-25 mm. **Notes**: uniformly pale gray pubescence with very faint mottling and sharp pronotal spines. No other similarly colored NE longhorns are nearly so large.

336. ***Hebestola nebulosa*** Haldeman [p. 128]
Size: 12-16 mm. **Notes**: The extremely uniform and dull brownish coloration (including antennae) of this species, in combination with its elongate shape and unspined pronotum, make this species easily recognizable. The robust scape with a shelflike apex is shared with other Monochamini, but is not possessed by other similarly colored longhorns.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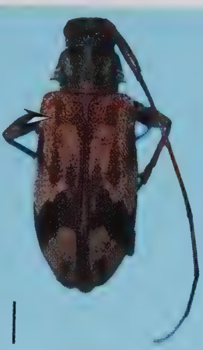
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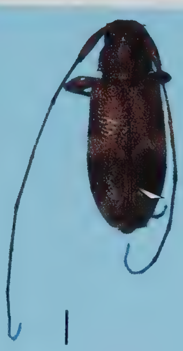
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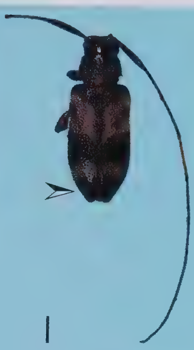
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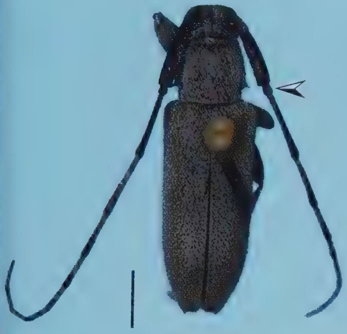
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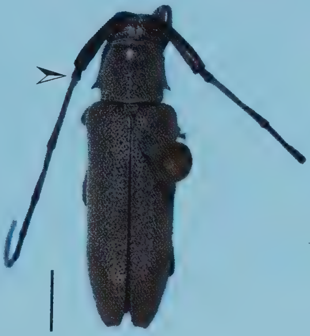
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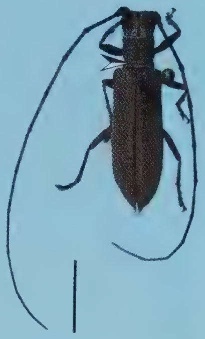
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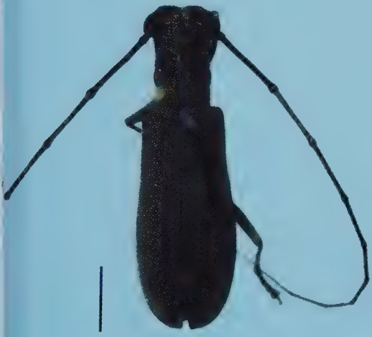
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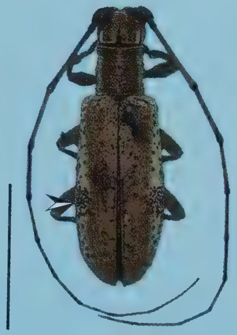
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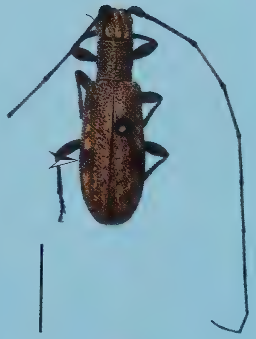
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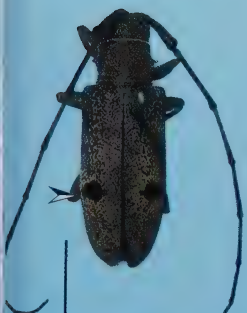
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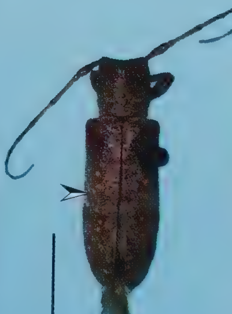
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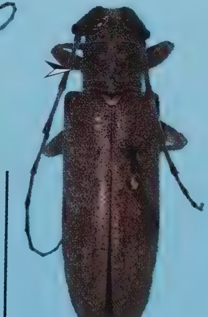
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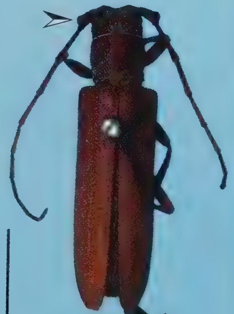
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PLATE 30: Figures 337-349

337. ***Goes pulcher*** (Haldeman) [p. 127] "Living-hickory Borer"
Size: 18-27 mm. **Notes**: distinctively marked species, with broad pale yellowish bands on the dark elytra, not mottled as in *G. debilis* or *G. variegatus*.

338. ***Goes variegatus*** Linsley & Chemsak [p. 128]
Size: 14-18 mm. **Notes**: resembles *G. debilis*, but has stronger lateral pronotal projections, a somewhat darker integument, and more uniformly yellowish pubescence.

339. ***Goes debilis*** LeConte [p. 127] "Oak Branch Borer"
Size: 11-16 mm. **Notes**: only likely to be confused with *G. variegatus*, from which it can be distinguished by the gray-tinged elytral bases, somewhat lighter body color, weaker mottling, and weaker pronotal spines.

340. ***Goes tigrinus*** (DeGeer) [p. 128] "White Oak Borer"
Size: 22-34 mm. **Notes**: dark body and distinctive strongly mottled white pubescence (*G. variegatus* is mottled similarly, but the pubescence is largely yellowish).

341. ***Goes tesselatus*** (Haldeman) [p. 127-128] "Oak Sapling Borer"
Size: 20-30 mm. **Notes**: similar to *G. tumifrons*, with scattered pale spots of pubescence on the elytra, but the "background" elytral pubescence in *tesselatus* is usually in a series of narrow, alternating gray and yellowish longitudinal stripes (sometimes easiest to see from the posterior rather than dorsal view). See synopses for details.

342. ***Goes tumifrons*** Linsley & Chemsak [p. 128]
Size: 22-31 mm. **Notes**: greatly resembles *G. tesselatus*, but the pubescence is always uniformly grayish (with a yellow tint), the face bulges out more noticeably, the lower eye lobes are more nearly circular, with a weakly arched lower margin, the body is typically more robust, and the covering of hair on the pronotum is rather thick.

343. ***Monochamus notatus*** (Drury), a = male, b = female [p. 129] "Northeastern Sawyer"
Size: 23-35 mm. **Notes**: pronotum somewhat shining, elytral pubescence largely gray in males, females more variegated and quite similar to *M. titillator*, though recognizable by lack of elytral sutural spines, generally blacker body color, with whiter pubescence on the head and thorax, the head often broadest below the eyes, which have relatively small lower lobes.

344. ***Monochamus titillator*** (Fabricius), a = female, b = male [p. 129] "Southern Pine Sawyer"
Size: 17-31 mm. **Notes**: body reddish-brown, pubescence quite variegated, and strong spines at elytral sutural tips. Reliably separated from *M. carolinensis* by the paler pubescence, weaker elytral punctation, and stronger elytral spines, and from *M. notatus* by several features listed above.

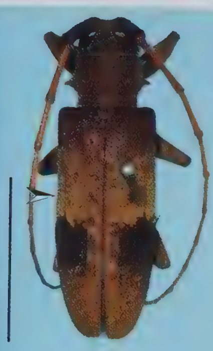
345. ***Monochamus carolinensis*** (Olivier) [p. 129]
Size: 15-23 mm. **Notes**: similar to *M. mutator* in appearance, but tends to be more reddish-brown, with distinct stripes of white pubescence dorsally on the pronotum, though with less pale pubescence than species such as *M. titillator*. The punctures are relatively large and crowded over much of the elytral surface, while the teeth at the elytral tips are small.

346. ***Monochamus mutator*** LeConte [p. 129] "Spotted Pine Sawyer"
Size: 17-27 mm. **Notes**: similar to the preceding, including the strong, dense elytral punctation, but darker, with white pubescence most concentrated on lateral pronotal projections and scutellum, no white bands on dorsal pronotum.

347. ***Monochamus s. scutellatus*** (Say), a = male, b = female [p. 129] "White-spotted Sawyer"
Size: 13-27 mm. **Notes**: elytra shining black beneath pubescence, which in males is mostly dark (and rubs off easily), while females typically have many more white patches mixed in.

348. ***Monochamus marmorator*** Kirby [p. 129] "Balsam Fir Sawyer"
Size: 18-29 mm. **Notes**: elytra reddish and shining, with narrowed tips, pubescent patches both yellowish and whitish.

349. ***Plectrodera scalator*** (Fabricius) [p. 130] "Cottonwood Borer"
Size: 21-40 mm. **Notes**: strikingly black and white, one of the most recognizable North American longhorns.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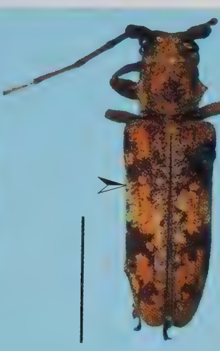
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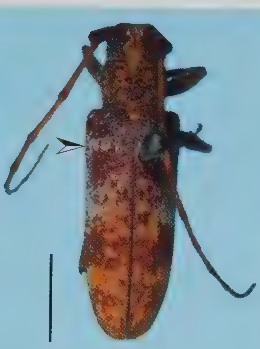
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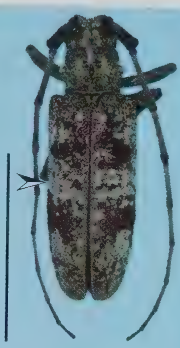
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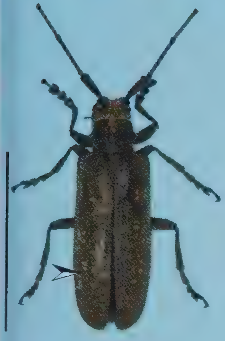
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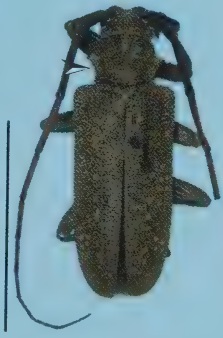
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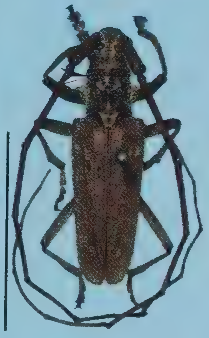
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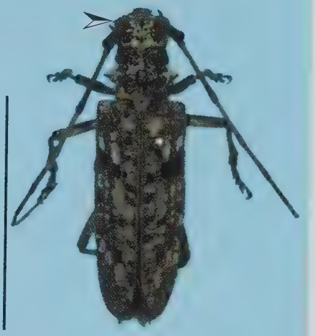
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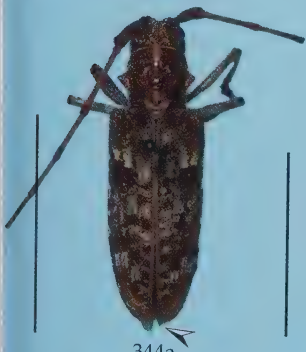
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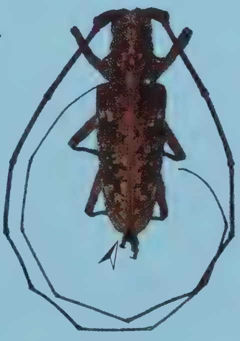
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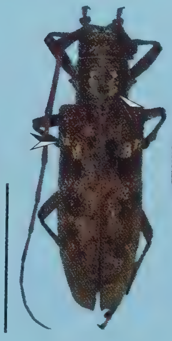
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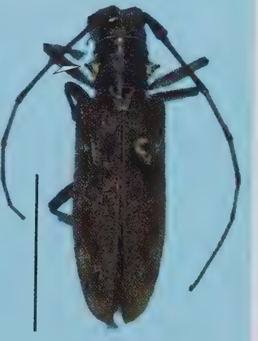
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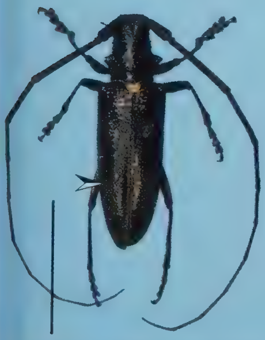
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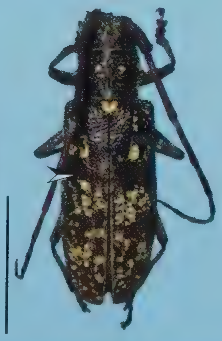
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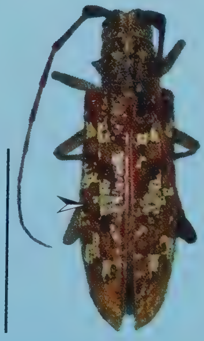
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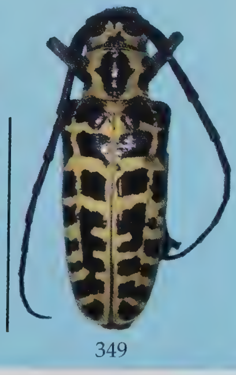
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PLATE 31: Figures 350-361

LYCIDAE

350. ***Celestes basalis*** LeConte

Head concealed by pronotum, antennae usually serrate, elytra with network of ridges. Tarsal segmentation 5-5-5 (from front to back legs).

CANTHARIDAE

351. ***Cantharis impressus*** LeConte
352. ***Chauliognathus pennsylvanicus*** DeGeer
353. ***Belotus abdominalis*** LeConte

Pronotum with sharp lateral margins, partially concealing head; antennae not arising from tubercles. Tarsal segmentation 5-5-5.

RHIPIPHORIDAE

354. ***Macrosiagon flavipenne*** LeConte

Antennae very short, serrate or feathery, not arising from tubercles. Tarsal segmentation 5-5-4.

TENEBRIONIDAE

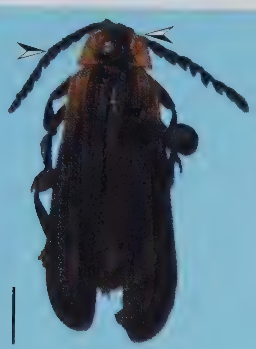
355. ***Strongylium tenuicolle*** (Say)
356. ***Upis ceramboides*** (Linnaeus)

Shelflike projection of face concealing base of antennae (which are sometimes clubbed), creating emargination in eyes. Tarsal segmentation 5-5-4.

CHRYSOMELIDAE

357. ***Lema trilineata*** Olivier
358. ***Lema simulans*** Schaeffer
359. ***Plateumaris sulcicollis*** (Lacordaire)
360. ***Donacia tuberculifrons*** Schaeffer
361. ***Donacia cincticornis*** Newman

Antennal scape often very short, pronotum often broadest at front in cerambycid-like species (members of Donaciinae often with spines on hind femora), eyes rarely emarginate. Tarsal segmentation apparently 4-4-4, as in Cerambycidae.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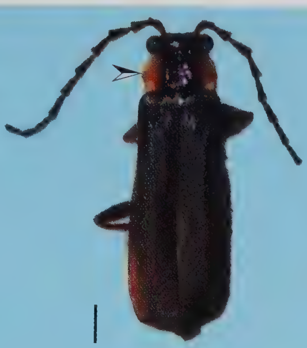
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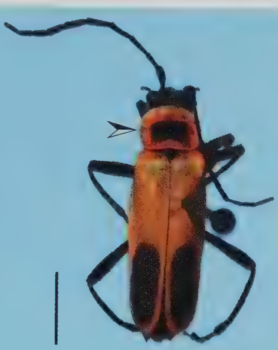
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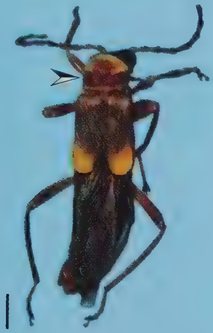
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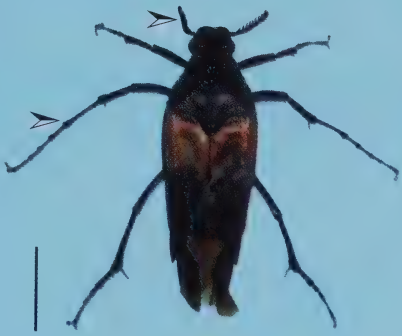
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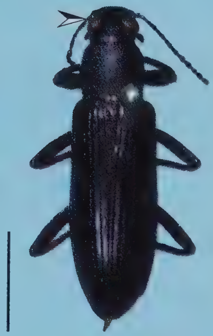
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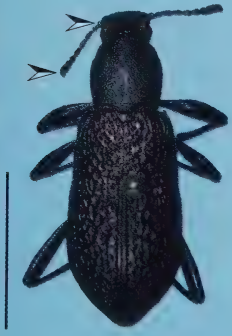
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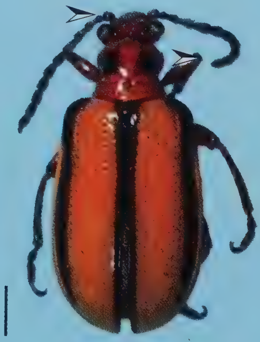
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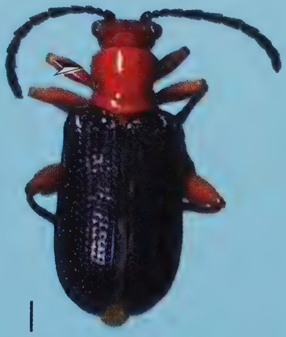
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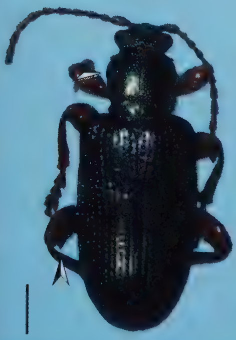
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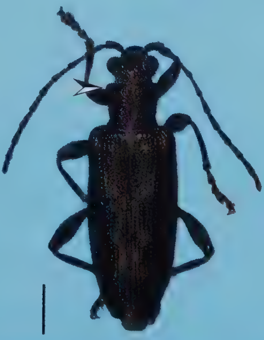
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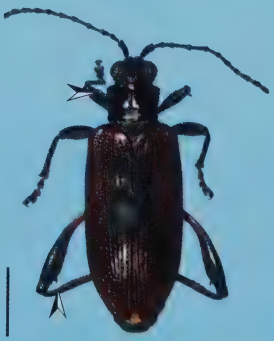
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PLATE 32: Figures 362-375

CARABIDAE

362. ***Helluomorphoides praestus bicolor*** Harris
363. ***Galerita janus*** Fabricius
364. ***Scaphinotus andrewsi*** Harris
365. ***Scarites subterraneus*** Fabricius

Antennae arising between eyes and mandibles, not from tubercles. Pronotum often broadest at front. Tarsal segmentation 5-5-5.

LUCANIDAE

366. ***Dorcus parallelus*** (Say)

Antennae short and strongly clubbed. Tarsal segmentation 5-5-5.

CUCUJIDAE

367. ***Cucujus clavipes*** Fabricius
368. ***Brontes dubius*** Fabricius

Extremely flattened, antennae not arising from tubercles. Tarsal segmentation 5-5-5 or 5-5-4.

MELOIDAE

369. ***Epicauta vittata*** (Fabricius)

Antennae not arising from tubercles. Tarsal segmentation 5-5-4.

OEDEMERIDAE

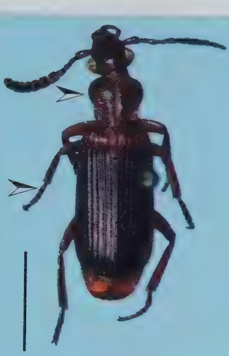
370. ***Nacerdes melanura*** Linnaeus
371. ***Ditylus coeruleus*** Randall
372. ***Oxacis cana*** LeConte

Pronotum always broadest at front, antennae not arising from tubercles. Tarsal segmentation 5-5-4.

CEPHALOIDAE

373. ***Stenotrachelus aeneus*** Fabricius
374. ***Cephaloon lepturides*** Newman
375. ***Cephaloon ungulare*** LeConte

Tarsal claws often comb-like, with lobes beneath. Antennae not arising from tubercles. Tarsal segmentation 5-5-4.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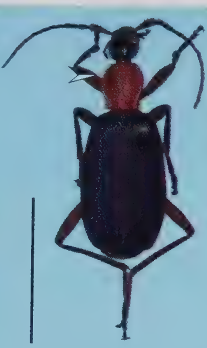
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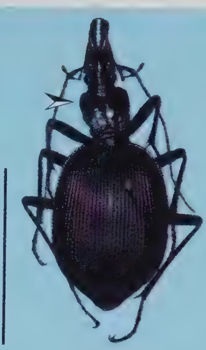
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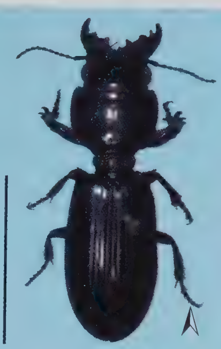
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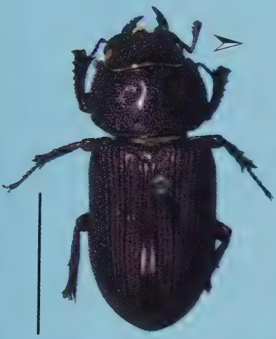
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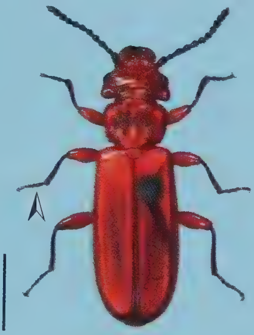
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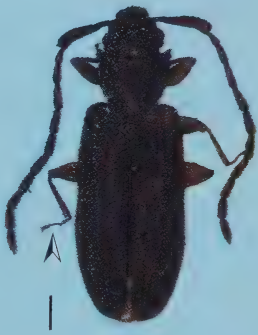
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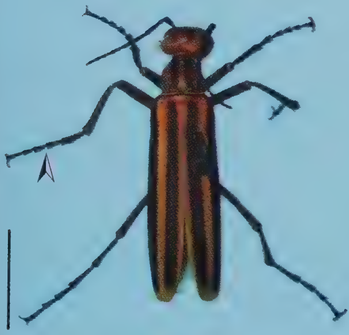
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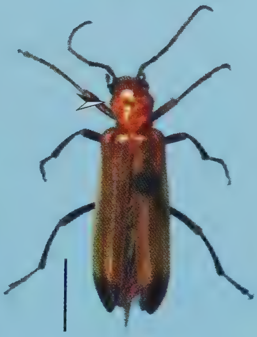
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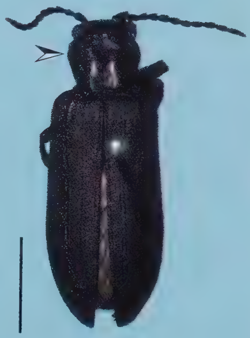
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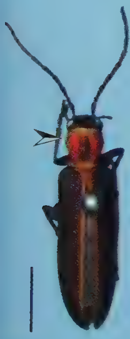
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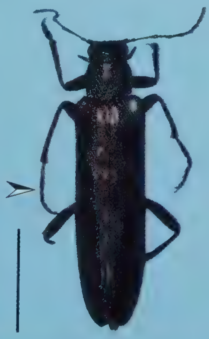
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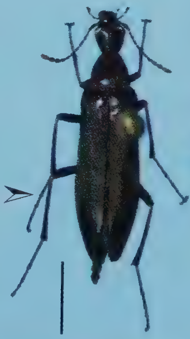
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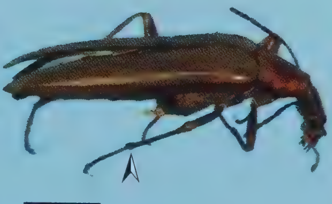
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cont. from page 53

Phymatodes dimidiatus (Kirby) [Fig. 195]

Flight Period: May-July, Great Lakes area

Larval Feeding Habits: under conifer bark. **Size**: 8-11 mm. **Notes**: distinguished by dull pronotum and elytra, and elytra red at base, black at tip. Mostly western range.

Phymatodes lengi Joutel [Fig. 190]

Flight Period: June-July, Atlantic Coast

Larval Feeding Habits: ? **Size**: 5-7 mm. **Notes**: very similar to *P. amoenus* (see p. 53 for distinguishing features), but otherwise distinctive.

Phymatodes lividus* (Rossi) [Fig. 191]

Flight Period: June, NEUS

Larval Feeding Habits: ? **Size**: 5-8 mm. **Notes**: pronotum darkened at sides with light central depression, resembling some individuals of *P. testaceus*, but with more clearly punctate elytra and less developed pronotal calli. European species, evidently established in NA, based on numerous specimens from many years and places, especially New York.

Phymatodes maculicollis LeConte [Fig. 192]

Flight Period: May-July, Great Lakes area

Larval Feeding Habits: under bark of fir and spruce branches. **Size**: 7-9 mm. **Notes**: pronotum reddish with dark band or spot in center, elytra with fine pubescence, somewhat resembling a firefly/lightningbug (Lampyridae) but without light organ. Ranges over much of Pacific West, but rare in East.

Phymatodes sp. [not illus.]

Flight Period: July, NENA

Larval Feeding Habits: ? **Size**: 6 mm. **Notes**: A record exists in the literature of *P. fulgidus* Hopping from Quebec, Canada, but the author of the record has since concluded that the specimens (some also collected in New York) in fact represent an undescribed species, which I have had an opportunity to examine. It is most similar to the dark form of *P. ater* in that it is entirely dark brown, but it lacks prominent pronotal calli and has finer elytral punctures.

Phymatodes testaceus (Linnaeus) [Fig. 188a-b]

Flight Period: April-July, ENA

Larval Feeding Habits: in and under bark of hardwoods, incl. oak, hickory, also pine. **Size**: 8-17 mm. **Notes**: The "Tanbark Borer" is large and quite variable in color (though never with a truly dark body), with distinct pronotal calli, but most recognizable by the very finely punctate elytra. Quite common, it also occurs in Europe and northern Africa.

Phymatodes varius (Fabricius) [Fig. 196a-b]

Flight Period: April-July, ENA.

Larval Feeding Habits: under bark of oak and hickory. **Size**: 5-10 mm. **Notes**: usually somewhat dull, pronotum and base of elytra usually reddish (sometimes black), with paired transverse or arcuate white bands on elytra. Black individuals distinguished from well-marked specimens of *P. ater* by duller body, lack of pronotal calli, more transverse markings. Range extends into SW.

Physocnemum andreae (Haldeman) [Fig. 211]

Flight Period: June-July, Atlantic Coast

Larval Feeding Habits: under cypress bark. **Size**: 17-21 mm. **Notes**: very distinctive; pale elytral ridges converge at middle, forming "X", body reddish-brown. The "Cypress Bark Borer" is the largest species in the genus, and though uncommon it ranges from the southeast US up into Quebec.

Physocnemum brevilineum (Say) [Fig. 212a-b]

Flight Period: April-August, ENA

Larval Feeding Habits: within bark of living elms. **Size**: 7-20 mm. **Notes**: The "Elm Bark Borer" has elytra slightly shining, often pale or reddish in middle, punctures weakened apically, and with distinctive pattern of pale ridges.

Physocnemum violaceipenne Hamilton [Fig. 213]

Flight Period: April-August, NENA

Larval Feeding Habits: in dead branches of white oak. **Size**: 8-17 mm. **Notes**: generally smaller, dark species with uniformly opaque elytra, with ridges rarely dark (if so, lateral calli at base of pronotum make it recognizable as a *Physocnemum*).

Pronocera c. collaris (Kirby) [Fig. 186]

Flight Period: June-August, NNA

Larval Feeding Habits: pine and spruce. **Size**: 9-14 mm. **Notes**: resembles a few other longhorns with the same basic coloration, but the particular details are fairly distinctive; slightly swollen femora, pronotum polished and narrower than the elytra, and dull, densely punctate elytra. Uncommon boreal forest species, but ranges into Rocky Mountains and also recorded from North Carolina. Adults often found resting on poplar and willow.

Ropalopus sanguinicollis (Horn) [Fig. 210]

Flight Period: June-July, NENA

Larval Feeding Habits: under bark of living wild cherry. **Size**: 10-17 mm. **Notes**: The combination of opaque black elytra, slightly clubbed legs, and broad, red, punctate pronotum is distinctive.

Semanotus l. ligneus (Fabricius) [Fig. 143]

Flight Period: March-August, C & ENA

Larval Feeding Habits: juniper, cedar. **Size**: 8-12 mm. **Notes**: The "Cedar Tree Borer" is fairly distinctive in appearance and generally has much more orange on elytra than following species, though some specimens are largely dark. Typically less hairy than following species, but this is difficult to quantify in a reliable manner. All individuals well-marked with red probably will belong to this species, but darker individuals not reared from known hosts are more equivocal.

Semanotus litigiosus (Casey) [Fig. 144]

Flight Period: May-July, NA

Larval Feeding Habits: fir, spruce, sometimes hemlock. **Size**: 8-12 mm. **Notes**: The "Fir Tree Borer" typically has reddish marks on elytra reduced or absent (if present, small spots or vague transverse bands). Almost impossible to tell this uncommon species from dark variants of *S. ligneus*, which may co-occur. It is probably best to treat all identifications to this species as tentative, unless reared from known host (about the only reliable difference between these species).

Tribe **Clytini**

Calloides n. nobilis (Harris) [Fig. 105a-b]

Flight Period: May-October, ENA

Larval Feeding Habits: stumps and bases of dead or dying hardwoods (incl. oak, ash, chestnut). **Size**: 18-25 mm. **Notes**: large species, often with distinctive yellow markings, but even unmarked individuals cannot be mistaken easily for any other NE longhorns, with the round, smooth pronotum and unspined antennae. Attracted to bait traps.

Clytoleptus albofasciatus (Castelneau and Gory) [Fig. 202a-b]

Flight Period: May-August, ENA

Larval Feeding Habits: mine in dead or dying grapevines, rarely hickory. **Size**: 7-10 mm. **Notes**: While there are several longhorns of this general appearance, the particular minimal pattern of white stripes is distinctive; the “Grape Trunk Borer” may or may not have red elytral bases.

Clytus marginicollis Castelneau and Gory [Fig. 118]

Flight Period: April-July, ENA

Larval Feeding Habits: under bark of fresh-cut or broken pine branches. **Size**: 6-10 mm. **Notes**: compact body shape and banding pattern distinctive, somewhat resembling a small, hairy wasp.

Clytus ruricola (Olivier) [Fig. 119]

Flight Period: May-August, NENA

Larval Feeding Habits: decaying hardwood, esp. maple. **Size**: 10-15 mm. **Notes**: black body with strong yellow bands; middle “U”-shaped elytral band is distinctive, though some *Xylotrechus* are somewhat similar.

Glycobius speciosus (Say) [Fig. 112]

Flight Period: June-August, NENA

Larval Feeding Habits: mines under bark of living sugar maple. **Size**: 20-30 mm. **Notes**: a large, attractive, and distinctive species, the “Sugar Maple Borer” may be a significant pest at times.

Megacyllene angulifera (Casey) [Fig. 108a-b]

Flight Period: August-September, NCNA

Larval Feeding Habits: ? **Size**: 10-20 mm. **Notes**: most reliably separated from other species in the genus by the lack of distinct longitudinal elytral ridges near the suture; it also has fairly thick elytral bands (alternating yellow and white, or all pale yellow). Uncommon, but can be found with *M. robiniae* on goldenrod in fall.

Megacyllene caryae (Gahan) [Fig. 111a-c]

Flight Period: March-June, ENA

Larval Feeding Habits: mines in newly dead hickory, sometimes other hardwoods. **Size**: 10-20 mm. **Notes**: The “Painted Hickory Borer” always has large black patch on metepisternum, typically elytral bands narrow and alternating white and yellow. Flies earlier than *M. robiniae*, with which it is often confused. Attracted to UV lights.

Megacyllene decora (Olivier) [Fig. 107a-d]

Flight Period: June-October, CNA

Larval Feeding Habits: stems of false indigo (*Amorpha fruticosa*). **Size**: 12-25 mm.

Notes: fairly thick elytral bands, but extremely variable (most common pattern is for basal yellow bands to fuse, while middle and apical yellow bands are of medium thickness or absent); yellow color dark, usually closer to orange than in other species, and middle band of pronotum, when present, does not reach lateral margins.

Megacyllene lutosa (LeConte) [Fig. 106]

Flight Period: June, CUS

Larval Feeding Habits: [?] **Size**: 9-11 mm. **Notes**: This very rare species is unique; small, no elytral ridge, covered with yellow pubescence. Known primarily from Kansas and Iowa.

Megacyllene powersi Linsley and Chemsak [Fig. 109a-b]

Flight Period: August-October, CNA

Larval Feeding Habits: ? **Size**: 12-20 mm. **Notes**: This uncommon species resembles one extreme form of *M. decora*, but all the yellow bands of elytra are quite thick, and brighter yellow as in *M. robiniae*; when partial fusion of bands occurs, it is usually the middle yellow bands.

Megacyllene robiniae (Forster) [Fig. 110a-b]

Flight Period: June-November, EUS

Larval Feeding Habits: mining in heartwood of black locust and yellow locust. **Size**: 11-28 mm. **Notes**: the “Locust Borer” is one of our most well-known longhorns, similar to *M. caryae*, but flies later, and has all-yellow elytral markings, and almost entirely yellow metepisternum. This species has greatly expanded its range across North America, wherever people have distributed black locust. Adults commonly encountered on goldenrod flowers.

Neoclytus a. acuminatus (Fabricius) [Fig. 104]

Flight Period: March-October, ENA

Larval Feeding Habits: sapwood of most eastern hardwoods (esp. ash), also shrubs and vines. **Size**: 4-13 mm. **Notes**: the “Red-headed Ash Borer” is common and distinctive, with antennae thickened at tips. Attracted to UV lights.

Neoclytus approximatus (LeConte) [Fig. 128]

Flight Period: June-August, CUS

Larval Feeding Habits: ? **Size**: 6-11 mm. **Notes**: small, distinctive reddish species with three yellow elytral bands, the middle one strongly angled, and antennae thickened at tips.

Neoclytus caprea (Say) [Fig. 117]

Flight Period: March-June, NA

Larval Feeding Habits: sapwood of ash, sometimes oak, hickory. **Size**: 8-17 mm. **Notes**: a relatively hairy species, with the first two elytral bands typically joined along the midline to form two loops, and a distinct stripe behind the head. The “Banded Ash Borer” ranges over entire US except Pacific Coast and at least into eastern Canada.

Neoclytus horridus (LeConte) [Fig. 127]

Flight Period: April-July, C & ENA

Larval Feeding Habits: oaks. **Size**: 6-11 mm. **Notes**: similar to *N. leucozonus*, but with more slender body, more elongate pronotum, stronger apical elytral spines, and antennae clearly thickened at the tips; also, middle elytral band roughly "M"-shaped or transverse, apical band more oblique.

Neoclytus j. jouteli Davis [Fig. 199]

Flight Period: July-August, EUS

Larval Feeding Habits: hickory. **Size**: 4-8 mm. **Notes**: this uncommon species is small, black, with two elytral bands, resembling *Euderces pini*, but body more cylindrical, ridges on pronotum (as in other *Neoclytus*), and antennae thickened at tips. A more southern subspecies has a more reddish body, but this may only be a color form as seen in other antlike longhorns.

Neoclytus l. leucozonus (Castelneau and Gory) [Fig. 126]

Flight Period: May-September, NNA

Larval Feeding Habits: various conifers. **Size**: 5-12 mm. **Notes**: Somewhat variable in size and markings, it resembles *N. horridus* but with slender antennae, middle elytral band more oblique (typically forming an inverted "V" shape), apical band more transverse. Ranges into Rockies.

Neoclytus m. mucronatus (Fabricius) [Fig. 115]

Flight Period: April-October, EUS

Larval Feeding Habits: beneath bark of dead and dying hickory, rarely pine. **Size**: 8-20 mm. **Notes**: a robust species with strong spines at elytral and femoral apices, very distinctive markings. Fairly common and quite variable in size.

Neoclytus scutellaris (Olivier) [Fig. 116]

Flight Period: May-October, ENA

Larval Feeding Habits: in sapwood, typically oak or hickory. **Size**: 7-16 mm. **Notes**: somewhat similar to *N. mucronatus*, but distinctive band across pronotum and grayish elytral bases.

Sarosesthes fulminans (Fabricius) [Fig. 125]

Flight Period: May-August, C & ENA

Larval Feeding Habits: under bark and sapwood of hardwoods, esp. chestnut and oak. **Size**: 12-22 mm. **Notes**: distinctive "eyespot" on pronotum and thin, angulate elytral bands make this species easily recognized. Attracted to bait traps.

Xylotrechus aceris Fisher [Fig. 131]

Flight Period: June-August, NENA

Larval Feeding Habits: branches and wounds in live maple. **Size**: 10-14 mm. **Notes**: The "Gall-making Maple Borer" causes swellings to form around the wounds where the larvae feed. The small anterior pronotal markings are whitish and continue to the ventral margin, distinguishing this from *X. quadrimaculatus* (while the dark pronotum with somewhat pale elytra make these two uncommon species otherwise distinctive in the genus).

Xylotrechus a. annosus (Say) [Fig. 124]

Flight Period: May-July, NC & NENA

Larval Feeding Habits: dead and dying willows and poplars. **Size**: 9-15 mm. **Notes**: pronotum and elytra with short, almost bristly white pubescence over surface, giving a distinctive grizzled appearance.

Xylotrechus colonus (Fabricius) [Fig. 129]
Flight Period: April-October, ENA
Larval Feeding Habits: in or under bark of virtually all eastern hardwoods, esp. hickory, also pine. **Size**: 8-15 mm. **Notes**: The "Rustic Borer" is quite common, recognizable by broad pale markings in distinctive pattern and narrow, sinuate basal yellow band. Attracted to UV lights.

Xylotrechus convergens LeConte [Fig. 114]
Flight Period: June-July, ENA
Larval Feeding Habits: mine in heartwood of dead hawthorn. **Size**: 8-13 mm. **Notes**: elytral and pronotal markings whitish to yellowish, in distinctive pattern. Rarely, the pronotal markings are enlarged and joined, similar to pattern in *X. integer*. Attracted to bait traps.

Xylotrechus gemellus Casey [Fig. 121]
Flight Period: ?, EUS
Larval Feeding Habits: [?] **Size**: 14-15 mm. **Notes**: robust species slightly similar to *X. undulatus* in appearance, but with thick middle and apical elytral bands. Very rare (perhaps extinct?), recorded from Indiana in the early 1900s. A Rocky Mountain species of similar appearance (but with yellower markings), *X. obliteratus*, was once listed as occurring in the eastern US, but this record was in error. The female of *gemellus* has the 5th sternite without an apical notch (though the pygidium does have one), further distinguishing it from similar species.

Xylotrechus integer (Haldeman) [Fig. 123]
Flight Period: June-July, NENA
Larval Feeding Habits: balsam fir, hemlock. **Size**: 9-15 mm. **Notes**: pronotum very broad, with considerable white on sides and dorsally; elytral markings somewhat similar to males of *X. undulatus*, with some weak longitudinal stripes medially.

Xylotrechus nitidus (Horn) [Fig. 113]
Flight Period: June-July, EUS
Larval Feeding Habits: [?] **Size**: 10-12 mm. **Notes**: uncommon; markings yellow, in distinctive pattern; elytra truncate, weakly toothed.

Xylotrechus quadrimaculatus (Haldeman) [Fig. 132]
Flight Period: May-August, NENA
Larval Feeding Habits: girdlers of live branches of beech, alder, birch. **Size**: 8-15 mm. **Notes**: The "Birch and Beech Girdler" is somewhat similar to *X. aceris*, but with several well-defined, yellowish thoracic markings (including mesepisternum) and more strongly oblique elytral bands.

Xylotrechus s. sagittatus (Germar) [Fig. 130]
Flight Period: June-September, ENA
Larval Feeding Habits: conifers, esp. pine. **Size**: 12-25 mm. **Notes**: reddish, with pale pubescence primarily down midline of elytra. Disjunct populations along eastern edge of Rockies. Attracted to UV lights.

Xylotrechus schaefferi Schott [Fig. 120]
Flight Period: June-August, NENA

Larval Feeding Habits: cones of pitch pine, jack pine. **Size**: 8-14 mm. **Notes**: rare species, markings fairly distinctive, though sometimes reduced. Males with granulate oval patches on head above eyes, as is seen in some other species.

Xylotrechus undulatus (Say) [Fig. 122a-b]

Flight Period: June-September, NNA

Larval Feeding Habits: various conifers. **Size**: 10-16 mm. **Notes**: The combination of elytral and pronotal markings is distinctive among NE species and differs slightly between the sexes as shown. Females tend to have the pale pubescence more yellowish than in males. The pale markings at the sides of the pronotal base are somewhat variably developed, but never as much as seen in *X. integer*. Fairly common, its range extends to Alaska.

Tribe **Anaglyptini**

Cyrtophorus verrucosus (Olivier) [Fig. 204]

Flight Period: April-July, ENA

Larval Feeding Habits: solid dead hardwoods, incl. oak, hickory, also pine. **Size**: 7-11 mm. **Notes**: variable as to the amount of reddish coloration, as with many other antlike longhorns; the markings are slightly similar to the following genus, but *verrucosus* has a high-arching pronotum and pronounced knobs at the elytral bases. Attracted to UV lights, bait traps; adults common on spring flowers.

Microclytus compressicollis (Castelneau and Gory) [Fig. 206]

Flight Period: May-June, NENA

Larval Feeding Habits: [?] **Size**: 5-7 mm. **Notes**: extremely similar to the following species, can be difficult to separate without a microscope, but with antennae longer (2nd segment much shorter than others), not hairy, and legs also less hairy. Otherwise, pattern of pubescent markings distinctive.

Microclytus gazellula (Haldeman) [Fig. 205]

Flight Period: May-June, ENA

Larval Feeding Habits: in outer bark of living oak and pignut hickory. **Size**: 5-8 mm. **Notes**: antennae shorter and hairier than preceding species, and legs hairier.

Tilloclytus geminatus (Haldeman) [Fig. 200]

Flight Period: May-July, ENA

Larval Feeding Habits: mine dead branches of hickory, oak, others, also pine. **Size**: 5-7 mm. **Notes**: yet another somewhat antlike species, somewhat resembling *Cyrtophorus* (arching pronotum and small lumps at elytral bases), but again with distinctive markings, most notably with oblique glabrous stripes on elytral bases, outlined with single row of white hairs. Extreme southern specimens more reddish.

Tribe **Tillomorphini**

Euderces picipes (Fabricius) [Fig. 198a-b]

Flight Period: April-August, ENA

Larval Feeding Habits: beneath bark of branches of numerous hardwoods, esp. redbud, hickory. **Size**: 5-9 mm. **Notes**: usually entirely black (Fig. 198b), but in more southern areas the legs and elytral bases are reddish (Fig. 198a; previously considered a separate subspecies, but single populations may contain both color forms); pronotum longitudinally striate, ivory ridges of elytra angled forward slightly toward midline. Fairly common antlike species, with adults abundant on flowers (other members of genus also).

Euderces pini (Olivier) [Fig. 197]

Flight Period: March-June, Atlantic Coast & SEUS

Larval Feeding Habits: various hardwoods. **Size**: 6-8 mm. **Notes**: similar to the red form of *E. picipes*, typically with head, pronotum, and elytral bases red, but always with an extra oblique pubescent stripe posteriorly on elytra. Occurs in some interior states and some all-red forms exist.

Euderces r. reichei LeConte [Fig. 201]

Flight Period: March-June, ECUS

Larval Feeding Habits: various hardwoods. **Size**: 4-5 mm. **Notes**: very small, pronotum punctate rather than longitudinally striate as in preceding species; ivory elytral ridges transverse rather than oblique, no posterior stripe.

Tribe **Rhopalophorini**

Rhopalophora longipes (Say) [Fig. 209]

Flight Period: May-August, EUS

Larval Feeding Habits: small dead branches of redbud, dogwood. **Size**: 6-9 mm. **Notes**: very distinctive appearance with slender, elongate body and long, clubbed femora; reddish pronotum with weak lateral pubescent stripes, and grayish elytra.

Tribe **Ancylocerini**

Ancylocera bicolor (Olivier) [Fig. 227]

Flight Period: April-July, SEUS

Larval Feeding Habits: hickory, oak, huisache. **Size**: 8-13 mm. **Notes**: very distinctive appearance with black, elongated, cylindrical pronotum almost as long as the bright red body. The males have very long, slender antennae, but the females have the antennae much shorter than body, segments broadened somewhat (they may therefore be difficult to recognize as Cerambycids). Generally found from Florida to Texas, but recorded from UV light trap in Virginia.

Tribe **Trachyderini**

Batyle ignicollis australis Linsley [not illus.]

Flight Period: April-June, SEUS

Larval Feeding Habits: dead pine branches. **Size**: 8-12 mm. **Notes**: very similar to nominate subspecies (below), known in NE from one record from Maryland; has even longer erect pubescence, especially at base of elytra, and denser on pronotum.

Batyle i. ignicollis (Say) [Fig. 187]

Flight Period: April-August, CUS

Larval Feeding Habits: stem borers in herbaceous plants, shrubs (e.g., sumac). **Size**: 8-13 mm. **Notes**: coloration similar to several other NE longhorns, but generally more shining, sparsely punctate, and with longer hairs, especially on pronotum. Adults common on flowers.

Batyle s. suturalis (Say) [Fig. 171]

Flight Period: April-September, E & CNA

Larval Feeding Habits: small dead twigs of oak, hickory, chestnut. **Size**: 7-9 mm.

Notes: bright red body with black appendages and thin black pubescence is distinctive. Adults common on flowers.

?Crossidius d. discoideus (Say) [Fig. 157]

Flight Period: August, CUS

Larval Feeding Habits: roots of herbaceous composites such as *Gutierrezia*. **Size**: 9-12 mm. **Notes**: coloration distinctive; pronotum largely red, sometimes with black markings; elytra black with reddish-orange markings, slightly dull, and with fine pubescence. Not definitively recorded from NE region, but occurs along Missouri River and in Mississippi, almost certainly occurs (at least historically) in Missouri.

Crossidius pulchellus (Say) [Fig. 158a-b]

Flight Period: August-October, CUS

Larval Feeding Habits: roots of herbaceous composites, such as *Gutierrezia* and *Haplopappus*. **Size**: 8-12 mm. **Notes**: pronotum largely or entirely dark; elytra with markings more yellowish than preceding species, surface more visibly shining. Mostly a SW and Rocky Mountain species, rarely into Missouri (last in 1939).

Purpuricenus axillaris Haldeman [Fig. 222a-b]

Flight Period: May-August, ENA

Larval Feeding Habits: girdles branches of oak, hickory, chestnut. **Size**: 13-20 mm. **Notes**: This and an as-yet-unnamed species (below) share a distinctive appearance; broad, yellowish elytral band, body otherwise very black, opaque, with rough, pitted pronotum. However, in *axillaris*, the lateral pronotal tubercles are typically large, the mid-dorsal tubercle is smooth, and the elytral surface immediately behind the yellow band is strongly punctate (see Fig. 182b). The "White Oak Branch Girdler" is attracted to bait traps.

Purpuricenus humeralis (Fabricius) [Fig. 224]

Flight Period: June-August, ENA

Larval Feeding Habits: mines in dead branches of numerous hardwoods. **Size**: 13-20 mm. **Notes**: distinctive appearance; elytral markings reduced to two reddish lateral triangles of various size, sometimes connecting at midline, otherwise black, opaque. Attracted to bait traps.

Purpuricenus sp. [Fig. 223]

Flight Period: May-July, CUS

Larval Feeding Habits: [oak, hickory?] **Size**: 12-14 mm. **Notes**: recently discovered in east-central Missouri and as yet unnamed, very difficult to distinguish from *P. axillaris* at first glance, but the lateral pronotal tubercles are small, the mid-dorsal tubercle is small and rough, and the elytral surface immediately behind the yellow band is virtually impunctate. Attracted to bait traps.

Tragidion coquus (Linnaeus) [Fig. 225a-b]

Flight Period: June-November, ENA

Larval Feeding Habits: mines in dead oak branches. **Size**: 15-25 mm. **Notes**: similar to the preceding genus; elytral coloration variable, from all yellow-orange to all black, but striate elytral sculpturing very distinctive. These beetles are mimics of spider wasps (Pompilidae), but are quite harmless. All-golden forms sometimes confused with SW species *T. auripenne* Casey, which differs in being more reddish, with strong bluish highlights on the black, and with more flattened hind tibiae.

Tribe **Pteroplatini**

Elytroleptus floridanus (LeConte) [Fig. 228]
Flight Period: May-June, Atlantic Coast
Larval Feeding Habits: ? **Size**: 8-11 mm. **Notes**: edges of elytra turned under, strong ridges on dorsal surface. Distinctive sculpturing and pattern of orange markings make this species greatly resemble the lycid beetles on which the adults are presumed to feed (a unique occurrence of predatory adults in Cerambycidae); whether this is an obligate predatory relationship is uncertain, as the feeding may be only to obtain defensive chemicals from the lycids rather than for nourishment.

Subfamily **LAMIINAE**

General notes: Long antennae (commonly longer than body) inserted high on head, head not narrowed behind eyes, eyes deeply divided (sometimes completely divided into separate lobes), short second antennal segment, undivided mesonotal stridulitrum. Most distinctive feature is that the face and jaws are directed straight down or slanted backwards (hypognathous) rather than projecting forwards (prognathous). Males of many species have distinctly elongated forelegs and expanded, fringed tarsi. Many species are girdlers, with adults chewing branches off before laying eggs in them; stem borers are also common in the group. As with Lepturinae, there has been a great deal of change in the generic and tribal nomenclature in the last century.

Tribe **Monochamini**

Goes debilis LeConte [Fig. 339]
Flight Period: May-August, ENA
Larval Feeding Habits: heartwood of living oak, hickory, chestnut. **Size**: 11-16 mm. **Notes**: The "Oak Branch Borer" is colored such that it is only likely to be confused with the much less common (and more southern) *G. variegatus*, from which it can be distinguished by the gray-tinged elytral bases, somewhat lighter body color, weaker mottling, and weaker pronotal spines.

Goes pulcher (Haldeman) [Fig. 337]
Flight Period: June-August, ENA
Larval Feeding Habits: heartwood of living oak, hickory, elm. **Size**: 18-27 mm. **Notes**: The "Living-hickory Borer" is a distinctively marked species, with broad pale yellowish bands on the dark elytra, not mottled as in *G. debilis* or *G. variegatus.*

Goes pulverulentus (Haldeman) [Fig. 335]
Flight Period: May-August, ENA
Larval Feeding Habits: heartwood of living hardwoods, esp. oak, beech (also sycamore, pine). **Size**: 18-25 mm. **Notes**: The "Living-beech Borer" has uniformly pale gray pubescence with very faint mottling and sharp pronotal spines. No other similarly colored NE longhorns are nearly so large.

Goes tesselatus (Haldeman) [Fig. 341]
Flight Period: May-September, EUS

Larval Feeding Habits: heartwood of living hardwoods, esp. oak. **Size**: 20-30 mm. **Notes**: The "Oak Sapling Borer" has scattered pale spots of pubescence on the elytra, which make it readily recognizable, with the exception of the much less common (and more southern) *G. tumifrons*. The most obvious feature separating these is that the "background" elytral pubescence in *tesselatus* is usually in a series of narrow, alternating gray and yellowish longitudinal stripes (sometimes easiest to see from the posterior rather than dorsal view as in the illustrations, unfortunately). There are several other features, subtle and somewhat difficult to use except in a side-by-side comparison: the face is flatter, the lower lobe of the eyes is more oval and strongly arched along the bottom edge, the body is relatively more slender, and there is a slightly thinner covering of hair on the pronotum.

Goes tigrinus (DeGeer) [Fig. 340]

Flight Period: May-October, EUS

Larval Feeding Habits: heartwood of living hardwoods, esp. oak. **Size**: 22-34 mm. **Notes**: The "White Oak Borer" has a dark body and distinctive strongly mottled white pubescence (*G. variegatus* is mottled similarly, but the pubescence is largely yellowish), and is at times a serious pest.

Goes tumifrons Linsley and Chemsak [Fig. 342]

Flight Period: July-September, SEUS

Larval Feeding Habits: [?] **Size**: 22-31 mm. **Notes**: This uncommon southern species greatly resembles *G. tesselatus*, but the pubescence is always uniformly grayish (with a yellow tint), the face bulges out more noticeably, the lower eye lobes are more nearly circular, with a weakly arched lower margin, the body is typically more robust, and the covering of hair on the pronotum is rather thick.

Goes variegatus Linsley and Chemsak [Fig. 338]

Flight Period: June-July, SEUS

Larval Feeding Habits: [?] **Size**: 14-18 mm. **Notes**: This very uncommon southern species resembles *G. debilis*, but has stronger lateral pronotal projections, a somewhat darker integument, and more uniformly yellowish pubescence (basally vs. apically - sometimes there are longitudinal variations in the color, or pubescence may be grayish toward the middle, but not at the base as in *debilis*). Attracted to UV lights.

Hebestola nebulosa Haldeman [Fig. 336]

Flight Period: May-July, ENA

Larval Feeding Habits: oak, chestnut, shadbush. **Size**: 12-16 mm. **Notes**: The extremely uniform and dull brownish coloration (including antennae) of this species in combination with its elongate shape and unspined pronotum make this species easily recognizable. The robust scape with a shelflike apex is shared with other Monochamini, but is not possessed by other similarly colored longhorns.

Microgoes oculatus (LeConte) [Fig. 333]

Flight Period: June-August, ENA

Larval Feeding Habits: beneath bark of numerous hardwoods and shrubs (also pine). **Size**: 8-15 mm. **Notes**: The strong "eyespots" on a grizzled background make the elytral pattern of this species quite distinctive.

Monochamus carolinensis (Olivier) [Fig. 345]
Flight Period: April-September, EUS
Larval Feeding Habits: dead and dying pine. **Size**: 15-23 mm. **Notes**: This fairly common species is most similar to *M. mutator* in appearance, but tends to be more reddish-brown, with distinct stripes of white pubescence dorsally on the pronotum. The general coloration includes less pale pubescence than species such as *M. titillator*, so the pale lateral basal elytral areas appear relatively more pronounced. The punctures are relatively large and crowded over much of the elytral surface, while the teeth at the elytral tips are small. Typically most active at night, as are other species.

Monochamus marmorator Kirby [Fig. 348]
Flight Period: June-September, NENA
Larval Feeding Habits: dead and dying fir, spruce. **Size**: 18-29 mm. **Notes**: The "Balsam Fir Sawyer" is the most distinctive of this group; elytra reddish and shining, with narrowed tips, pubescent patches both yellowish and whitish.

Monochamus mutator LeConte [Fig. 346]
Flight Period: June-September, Great Lakes area
Larval Feeding Habits: dead and dying conifers. **Size**: 17-27 mm. **Notes**: The "Spotted Pine Sawyer" is similar to *M. carolinensis*, including the strong, dense elytral punctation, but darker, with white pubescence most concentrated on lateral pronotal projections and scutellum, no white bands on dorsal pronotum.

Monochamus notatus (Drury) [Fig. 343a-b]
Flight Period: May-September, C & ENA
Larval Feeding Habits: dead and dying conifers, esp. pine. **Size**: 23-35 mm. **Notes**: the "Northeastern Sawyer" has pronotum a bit more shining than other species, elytral pubescence largely gray in males, while females can sometimes be variegated and quite similar to *M. titillator* in appearance, though recognizable by lack of elytral sutural spines, generally blacker body color, with whiter pubescence on the head and thorax, and the head often broadest below the eyes, which have relatively small lower lobes. Range includes some NW populations.

Monochamus s. scutellatus (Say) [Fig. 347a-b]
Flight Period: April-September, NA
Larval Feeding Habits: dead and dying conifers, esp. pine. **Size**: 13-27 mm. **Notes**: the "White-spotted Sawyer" has elytra shining black beneath pubescence, which in males is mostly dark (and rubs off easily), while females typically have many more white patches mixed in. Range of species covers all but CUS.

Monochamus titillator (Fabricius) [Fig. 344a-b]
Flight Period: March-October, ENA
Larval Feeding Habits: dead and dying pine, fir, spruce. **Size**: 17-31 mm. **Notes**: The "Southern Pine Sawyer" (a bit of a misnomer, as the species ranges to Quebec) has the body reddish-brown, pubescence quite variegated, and strong spines at elytral sutural tips. Reliably separated from *M. carolinensis* by the paler pubescence, weaker elytral punctation, and stronger elytral spines, and from *M. notatus* by several features listed above.

Plectrodera scalator (Fabricius) [Fig. 349]

Flight Period: June-September, C & EUS

Larval Feeding Habits: bore in bark at base of poplars, willows. **Size**: 21-40 mm. **Notes**: the strikingly black and white "Cottonwood Borer" is one of the largest and most recognizable North American longhorns, though any individual specimen's markings are as unique as fingerprints.

Tribe **Dorcaschematini**

Dorcaschema alternatum (Say) [Fig. 332]

Flight Period: April-August, EUS

Larval Feeding Habits: dead or dying branches of mulberry, osage orange. **Size**: 7-16 mm. **Notes**: This common species, known as the "Small Mulberry Borer," is more variable in appearance than other species in genus, but nonetheless distinctive, with the characteristic shape and long antennae of this group, plus strong mottling, yellow-orange striping, and large lateral dark patches on the elytra.

Dorcaschema cinereum (Olivier) [Fig. 329]

Flight Period: May-August, EUS

Larval Feeding Habits: dead branches of various hardwoods, incl. mulberry. **Size**: 8-13 mm. **Notes**: The uniform pale pubescence with dark central stripe on head and thorax, in combination with the body shape, make this species distinctive.

Dorcaschema nigrum (Say) [Fig. 330]

Flight Period: May-August, ENA

Larval Feeding Habits: dead or dying branches of hickory. **Size**: 7-12 mm. **Notes**: While shaped similarly to the preceding species, the entirely black coloration makes this species instantly recognizable.

Dorcaschema wildii Uhler [Fig. 331]

Flight Period: May-October, EUS

Larval Feeding Habits: living branches of mulberry, osage orange. **Size**: 15-23 mm. **Notes**: The "Mulberry Borer" is large and distinctive, with white lateral stripes running from the head backwards, and small scattered black spots (concentrated in two lateral circular areas). Attracted to UV lights.

Tribe **Apomecynini**

Dorcasta cinerea Horn [Fig. 261]

Flight Period: June-October, SCUS

Larval Feeding Habits: stem borer of living herbaceous plants (incl. nightshade, cotton, tobacco). **Size**: 6-11 mm. **Notes**: The elongate form, with banded, fringed antennae and pointed elytra with long scattered hairs arising from black punctures, make this species distinctive.

Tribe **Ataxiini**

Ataxia brunnea Champlain and Knull [Fig. 282]

Flight Period: June-July, CUS

Larval Feeding Habits: ? **Size**: 10-12 mm. **Notes**: This very rare species is quite similar to *A. hubbardi*, but pubescence is uniformly reddish-brown, without whitish tufts, and the elytral tips are more rounded.

Ataxia crypta (Say) [Fig. 281]
Flight Period: April-October, EUS
Larval Feeding Habits: branches of various hardwoods and shrubs. **Size**: 12-18 mm. **Notes**: distinguished from other species by broadly, obliquely truncate elytral tips, metasternum with very deep medial groove, and antennal scape with angled, shelflike apex. Attracted to UV lights.

Ataxia hubbardi Fisher [Fig. 283]
Flight Period: April-October, SCUS
Larval Feeding Habits: stem borers of living herbaceous plants, mostly composites. **Size**: 10-16 mm. **Notes**: mottled pubescence as in *A. crypta*, though a bit more visibly arranged in stripes; the more pointed elytral tips and very shallow metasternal groove further distinguish it. Attracted to UV lights.

Tribe **Apodasyini**

Eupogonius pauper LeConte [Fig. 289]
Flight Period: March-August, ENA
Larval Feeding Habits: numerous hardwoods, shrubs, and vines. **Size**: 6-11 mm. **Notes**: This common species has the elytral pubescence very irregular but covering much of the surface, unlike the somewhat similar and more reddish *E. tomentosus*. Coloration varies among populations on different host plants, and there may prove to be more than one species involved. Attracted to UV lights.

Eupogonius pubescens LeConte [Fig. 265]
Flight Period: June-July, NEUS
Larval Feeding Habits: linden. **Size**: 5-9 mm. **Notes**: pronotal projections weak, blunt, elytra smoothly but not densely gray pubescent. No other beetles of this size have this appearance, but it is possible to confuse this with unusually small specimens of *Saperda inornata*. The most visible features allowing separation are the pronotum with small lateral projections and weak median stripe. Attracted to lights.

Eupogonius subarmatus (LeConte) [Fig. 230]
Flight Period: May-August, ENA
Larval Feeding Habits: various hardwoods, incl. linden, elm. **Size**: 6-8 mm. **Notes**: pronotum black with two yellowish stripes, resembling a lycid beetle. Most likely to be confused with *Hemierana marginata*, but the pronotal stripes never continue onto the elytra, there are small but distinct lateral pronotal spines, and the basal antennal segments are much smaller.

Eupogonius tomentosus (Haldeman) [Fig. 288]
Flight Period: March-November, ENA
Larval Feeding Habits: pine, spruce, cedar. **Size**: 5-10 mm. **Notes**: similar to *E. pauper*, but body reddish-brown, elytra with small irregular patches of appressed pubescence, leaving large shining areas over most of the surface, and with thin black erect hairs. Attracted to UV lights.

Psenocerus supernotatus (Say) [Fig. 203]
Flight Period: April-July, ENA
Larval Feeding Habits: decaying branches of numerous hardwoods, shrubs, and vines.

Size: 4-8 mm. **Notes**: The pattern of markings and small swellings at base of the punctate elytra are fairly distinctive, making this common and slightly variable species somewhat antlike in appearance, though it is a bit more cylindrical than other ant-resembling species. Known as the "Currant-tip Borer."

Tribe **Pogonocherini**

Ecyrus d. dasycerus (Say) [Fig. 291]

Flight Period: April-August, ENA

Larval Feeding Habits: numerous hardwoods, esp. oak. **Size**: 4-10 mm. **Notes**: This species is rather variable in size, and darker and lighter variants occur, but the combination of body shape and the contrastingly dark, inverted arclike marking at the elytral base is distinctive (though the mark is sometimes faint, as in the individual shown). Attracted to UV lights.

Lypsimena fuscata LeConte [Fig. 280]

Flight Period: April-May, ENA

Larval Feeding Habits: [?] **Size**: 6-9 mm. **Notes**: elongate body shape, very long antennae, and elytra distinctively marked with weak irregular brownish/whitish stripes. This uncommon species also occurs in southern California, and its range extends down to Argentina. Attracted to UV lights.

Pogonocherus mixtus Haldeman [Fig. 287a-b]

Flight Period: May-September, NA

Larval Feeding Habits: conifers (esp. larch) and hardwoods. **Size**: 4-6 mm. **Notes**: This species is rather variable in coloration, but is easily separated from *P. parvulus* by the pronotum with acute lateral spines and shining dorsal calli, and elytra with erect, black scattered hairs covering the surface. Range covers most of continent except Pacific and CUS.

Pogonocherus parvulus LeConte [Fig. 286]

Flight Period: June-August, NENA

Larval Feeding Habits: willow. **Size**: 4-6 mm. **Notes**: Markings may resemble those of preceding species, but elytra without erect hairs, pronotal calli somewhat dull, with blunt spines. Also populations in Rockies.

Pogonocherus penicillatus LeConte [Fig. 285]

Flight Period: July-August, NA

Larval Feeding Habits: spruce. **Size**: 4-6 mm. **Notes**: pubescence distinctive; elytra with angled white basal band, four or five discrete tufts of black setae along median ridges. Range covers most of continent except Pacific and CUS.

Tribe **Onciderini**

Oncideres c. cingulata (Say) [Fig. 334]

Flight Period: April-November, EUS

Larval Feeding Habits: girdles branches of numerous hardwoods and shrubs, esp. persimmon, hickory. **Size**: 11-20 mm. **Notes**: This faintly-spotted species, with slightly paler medial band, is somewhat reminiscent of a *Goes* species, but has a very broad head, no pronotal tubercles, and slender antennal bases. The "Twig Girdler" can be a serious pest and is attracted to UV lights.

Tribe **Hippopsini**

Hippopsis lemniscata (Fabricius) [Fig. 260]

Flight Period: April-October, EUS

Larval Feeding Habits: stem borers of living herbaceous plants, mostly composites (esp. ragweed). **Size**: 7-15 mm. **Notes**: extremely slender striped body and conelike head with very long antennae distinctive among NE longhorns. Attracted to UV lights. Range extends down into South America.

Tribe **Acanthoderini**

Aegomorphus modestus (Gyllenhal) [Fig. 300]

Flight Period: May-September, ENA

Larval Feeding Habits: soft, decayed hardwoods (also pine). **Size**: 10-16 mm. **Notes**: This fairly common species is somewhat variable in coloration, but the combination of "M"-shaped markings on a mottled background and strong lateral pronotal spines are distinctive. Attracted to UV lights, bait traps.

Aegomorphus morrisii (Uhler) [Fig. 301]

Flight Period: June-July, ENA

Larval Feeding Habits: tupelo (also tuliptree?). **Size**: 20-26 mm. **Notes**: This rare and distinctive species is large, with small tufts of whitish hair rising from elytral punctures, and strong "M"-shaped black markings on a rather pale background.

Aegomorphus quadrigibbus (Say) [Fig. 302]

Flight Period: April-September, EUS

Larval Feeding Habits: soft, decayed hardwoods. **Size**: 9-16 mm. **Notes**: elytral bases with distinctive pale markings, color otherwise quite dark and often shining.

Oplosia nubila (LeConte) [Fig. 290]

Flight Period: May-July, NENA

Larval Feeding Habits: under bark of decaying linden, hickory, and beech. **Size**: 9-14 mm. **Notes**: The combination of shape and finely-mottled pattern of white and brown pubescence on otherwise slightly shining elytra makes this species distinctive.

Tribe **Acanthocinini**

[note: in *Acanthocinus*, *Eutrichillus*, and *Urographis*, females have the pygidium elongated into tubes; size measurements listed and scale bars on figures exclude this extra length]

Acanthocinus nodosus (Fabricius) [Fig. 318]

Flight Period: April-October, EUS

Larval Feeding Habits: bark of dead or dying pine. **Size**: 18-27 mm. **Notes**: This large species has very distinctive black markings on a gray body, and males have a prominent hair tuft at tip of fourth antennal segment. Attracted to UV lights.

Acanthocinus obsoletus (Olivier) [Fig. 314a-b]

Flight Period: April-September, ENA

Larval Feeding Habits: bark of dead or dying pine. **Size**: 9-17 mm. **Notes**: body mottled in a somewhat variable pattern, but tarsi always entirely dark-haired. Somewhat resembles *Urographis* species in shape and size, but elytra completely lacking erect hairs (also true of following species). Attracted to UV lights.

Acanthocinus pusillus Kirby [Fig. 313]

Flight Period: May-August, NNA

Larval Feeding Habits: bark of dead or dying pine, other conifers. **Size**: 7-13 mm. **Notes**: body mottled very much as in preceding species, often slightly more reddish, but tarsi always with light bands (otherwise quite difficult to distinguish). A somewhat similar western species, *A. obliquus* LeConte, has been collected near the western Iowa border; it has the elytra with strong longitudinal ridges and is darker gray.

Astylidius parvus (LeConte) [Fig. 305]

Flight Period: May-August, EUS

Larval Feeding Habits: various hardwoods, shrubs, and vines. **Size**: 5-7 mm. **Notes**: This small species is best recognized by the position of the rounded but prominent lateral pronotal tubercles, and the strong dark ridges on the elytral base. There are some forms of *Liopinus* with similar inverted "V"-shaped light elytral markings (but these are generally margined by a dark "shadow" marking, while *parvus* usually has the light marking only), but distinguishing features include those above, and the punctures along the pronotal base are much deeper and larger than those elsewhere.

Astylopsis arcuata (LeConte) [Fig. 296a-b]

Flight Period: April-October, SEUS

Larval Feeding Habits: pine. **Size**: 7-13 mm. **Notes**: elytra variably marked dorsally (generally with much reduced dark markings relative to other species in genus), often with oblique posterior bands, but always with distinctive dark epipleural margins. Range extends into Maryland along Atlantic Coast.

Astylopsis collaris (Haldeman) [Fig. 298]

Flight Period: May-August, NEUS

Larval Feeding Habits: various hardwoods, esp. oak. **Size**: 6-11 mm. **Notes**: This species tends to have more mottled elytra than the preceding species, with well-defined dark markings in the form of pronotal stripes and subhumeral dark spots, and without the well-defined light markings of the following species. Attracted to UV lights.

Astylopsis macula (Say) [Fig. 299]

Flight Period: May-September, ENA

Larval Feeding Habits: in and under bark of hardwoods, shrubs, and vines, esp. chestnut, linden, ironwood. **Size**: 6-9 mm. **Notes**: somewhat similar to preceding species, but with light pubescence in distinctive pattern; pronotum white at sides and darker along midline between black stripes, elytra with transverse triangular whitish marks converging at midline and variably developed whitish patches posterior to these along midline.

Astylopsis sexguttata (Say) [Fig. 297]

Flight Period: April-September, ENA

Larval Feeding Habits: under bark of conifers, esp. pine. **Size**: 6-11 mm. **Notes**: very similar to *A. collaris*, but black markings scattered on surface of elytra are actually small hair tufts, easily visible from side as tiny bumps. Attracted to UV lights.

Dectes sayi Dillon and Dillon [Fig. 328]

Flight Period: May-September, NENA

Larval Feeding Habits: stem borer of herbaceous plants, esp. ragweed. **Size**: 6-11 mm.

Notes: The uniform pubescence and thoracic shape make this genus distinctive, but the two species can be difficult to separate; *sayi* has the second antennal segment more elongate than *D. texanus* and the lower eye lobes are distinctly shorter than the facial area below them.

Dectes texanus LeConte [Fig. 327]

Flight Period: June-September, US

Larval Feeding Habits: stem borer of herbaceous plants, esp. ragweed. **Size**: 5-11 mm. **Notes**: distinguished from preceding species by markedly shorter second antennal segment and lower eye lobes roughly equal to facial areas. Fairly common, range includes all but northernmost US and Pacific Coast.

Eutrichillus biguttatus (LeConte) [Fig. 312]

Flight Period: May-August, ENA

Larval Feeding Habits: pine branches. **Size**: 6-11 mm. **Notes**: somewhat resembles *Urographis*, with a long female pygidium, but the sharp pronotal spine and markings make this species recognizable. The elongate dark spots below the middle of the elytra typically interrupt weak pale lines on an otherwise rather uniform background, though sometimes these markings are poorly defined. Attracted to UV lights.

Hyperplatys aspersa (Say) [Fig. 311a-b]

Flight Period: March-September, C & ENA

Larval Feeding Habits: under bark of various hardwoods (also moonseed vine, burdock). **Size**: 4-10 mm. **Notes**: Members of this genus are fairly common. The elytra are distinctively patterned with black spots and have a sharp-edged humerus; *aspersa* may be confused with the following species, but in particular lacks the dark epipleural areas and pale dorsal stripes, as well as sometimes lacking the large posterior elytral spots.

Hyperplatys maculata Haldeman [Fig. 310]

Flight Period: May-October, C & ENA

Larval Feeding Habits: various hardwoods, esp. linden, ironwood, serviceberry. **Size**: 4-8 mm. **Notes**: This species is quite variable in appearance, but there are distinctive faint pale stripes on the elytra. It almost always has dark epipleural areas, and always has the large posterior spots.

Leptostylopsis planidorsus (LeConte) [Fig. 295]

Flight Period: May-August, SEUS

Larval Feeding Habits: birch, redbud, grape. **Size**: 8-14 mm. **Notes**: This species has several weak dorsal pronotal tubercles, coloration variable but rather distinctive; tarsi entirely dark, pronotum almost uniformly pale, elytra with broad oblique pale areas (often an "X" or inverted "V" shape), and dark oblique marks apically, with tiny scattered black tufts. Range extends up to Maryland along Atlantic Coast.

Leptostylus asperatus (Haldeman) [Fig. 293]

Flight Period: April-August, SEUS

Larval Feeding Habits: oak, sumac. **Size**: 9-13 mm. **Notes**: This genus has the body surface very roughly sculpted into small lumps; *asperatus* is separated from the following species by spines at leg bases (trochanters), elytra largely whitish, in strong contrast to darker areas. Range extends up to Maryland along Atlantic Coast.

Leptostylus transversus (Gyllenhal) [Fig. 292]

Flight Period: March-October, C & EUS

Larval Feeding Habits: various hardwoods, vines and conifers. **Size**: 6-14 mm. **Notes**: somewhat variable in size and appearance, but the general dark, rough, mottled pattern with transverse subapical light markings is distinctive. Relatively common, attracted to UV lights.

Lepturges angulatus (LeConte) [Fig. 320]

Flight Period: March-August, EUS

Larval Feeding Habits: various hardwoods (also pine). **Size**: 5-10 mm. **Notes**: similar to following species, but elytral tips slightly angled, dark marks at middle of elytral bases small, lateral markings strongly contrasting with background color. Attracted to UV lights.

Lepturges confluens (Haldeman) [Fig. 321]

Flight Period: May-August, ENA

Larval Feeding Habits: various hardwoods, incl. hickory. **Size**: 5-10 mm. **Notes**: This fairly common species is similar to and slightly more variable than the preceding species, with elytral tips rounded, dark marks at middle of elytral bases oval, and lateral markings often suffused with grayish pubescence, creating a much more variegated appearance. Attracted to UV lights.

Lepturges pictus (LeConte) [Fig. 322]

Flight Period: May-August, ECUS

Larval Feeding Habits: hackberry, walnut. **Size**: 8-11 mm. **Notes**: greatly resembles some forms of *L. symmetricus*, but elytra without dark lateral markings connected along epipleural margin, and markings more strongly contrasting with background color. Attracted to UV lights.

Lepturges regularis (LeConte) [Fig. 319]

Flight Period: May-October, ECUS

Larval Feeding Habits: branches of buckeye, sometimes hickory. **Size**: 7-11 mm. **Notes**: very distinctive coloration; pronotum and elytra with large, well-spaced round black spots, antennae yellowish.

Lepturges symmetricus (Haldeman) [Fig. 323a-c]

Flight Period: May-August, NENA

Larval Feeding Habits: branches of various hardwoods, incl. hackberry. **Size**: 6-9 mm. **Notes**: very similar to *L. pictus*, but a bit more variably marked, elytra with dark lateral markings connected along epipleural margin, markings not so strongly contrasting. Attracted to lights.

Liopinus alpha (Say) [Fig. 309a-d]

Flight Period: March-October, C & ENA

Larval Feeding Habits: branches of numerous hardwoods, shrubs, and vines. **Size**: 4-9 mm. **Notes**: If the most recent rather conservative taxonomic treatment of this species is correct (which is by no means certain), this is one of our most common lamiines, with probably the most variable color pattern of any NE longhorn, aside from the dark markings on epipleural margins of elytra, which are relatively consistent. These lateral elytral markings are strong, extending forward to humeri. The dorsal elytral bands are strongly oblique, but are sometimes reduced or absent (Fig. 309c), and often there are also whitish patches present (as in form "fascicularis", Fig. 309b). Most of the species that might be confused with this are rather uniform in appearance, so the best approach to identifying members of this group is to rule out the other species, and anything left is probably *alpha* as presently defined. It is almost certain that this is a complex of very similar and closely related species, but far more detailed study is required to resolve their relationships, host and geographic ranges, and nomenclature. Attracted to UV lights.

Liopinus mimeticus (Casey) [Fig. 307]

Flight Period: April-October, EUS

Larval Feeding Habits: various hardwoods and shrubs, incl. maple, cherry. **Size**: 5-9 mm. **Notes**: very difficult to separate from *L. alpha* without a microscope (where features such as the shorter tarsal segments and more erect black tufts on elytra would be visible), but slightly broader body, typically paler color, with lateral elytral markings not extending forward to humeri, and elytral bands slightly less oblique.

Liopinus misellus (LeConte) [Fig. 308]

Flight Period: April-August, ENA

Larval Feeding Habits: various hardwoods, incl. maple, oak, hickory. **Size**: 4-7 mm. **Notes**: nearly indistinguishable from some forms of *L. alpha*, differing only in the reduced or absent epipleural markings. Some specimens may not fall easily into either species when identified, and clearly the relationships and diagnostics of these species are in need of more research. Attracted to UV lights.

Liopinus punctatus (Haldeman) [Fig. 306]

Flight Period: March-August, EUS

Larval Feeding Habits: various hardwoods and vines, incl. hackberry, persimmon. **Size**: 5-7 mm. **Notes**: mottled coloration over entire body, without discrete lateral stripes (though there tend to be lateral triangular paler areas, as in *Astylidius parvus*), thus relatively easy to separate from *L. alpha*. Attracted to UV lights.

Nyssodrysina haldemani (LeConte) [Fig. 304]

Flight Period: April-November, SEUS

Larval Feeding Habits: hackberry, strangler fig. **Size**: 7-10 mm. **Notes**: shape and coloration fairly distinctive; elytral markings somewhat variable, but shape and markings of prothorax uniform and unique, elytral tips strongly angled. Range extends into Maryland along Atlantic Coast and well south into Mexico.

Sternidius variegatus (Haldeman) [Fig. 303]

Flight Period: June-September, C & ENA

Larval Feeding Habits: branches of hardwoods, shrubs, vines, and conifers. **Size**: 7-11 mm. **Notes**: somewhat variable coloration, but the spots near the elytral apex, which are dark anteriorly and pale posteriorly, are distinctive. Fairly common, attracted to UV lights.

Styloleptus biustus (LeConte) [Fig. 294]

Flight Period: May-July, EC & SEUS

Larval Feeding Habits: numerous hardwoods and shrubs, incl. hickory. **Size**: 4-9 mm. **Notes**: similar to *Liopinus* at first glance, but readily distinguished by the rounded, rather than pointed, pronotal edges. The small size and the shape of the pronotum also separates this from *Leptostylopsis* or *Leptostylus*. The extent of dark markings is variable, at least lateral areas dark, but sometimes also strong markings along dorsal midline.

Urgleptes facetus (Say) [Fig. 326]

Flight Period: May-August, ENA

Larval Feeding Habits: branches of various hardwoods, esp. oak. **Size**: 3-4 mm. **Notes**: This very small species has the elytra distinctively marked and mostly dark; the broadly dark tips distinguish it from small individuals of *U. querci*.

Urgleptes querci (Fitch) [Fig. 325a-b]

Flight Period: May-September, ENA

Larval Feeding Habits: branches of numerous hardwoods, shrubs, and vines, esp. maple. **Size**: 4-6 mm. **Notes**: The elytral pattern of this species is relatively variable, but the markings below middle of elytra are broad, meeting at midline, and the basal markings tend to form a "T" shape along the midline.

Urgleptes signatus (LeConte) [Fig. 324]

Flight Period: June-August, ENA

Larval Feeding Habits: branches of various hardwoods, shrubs, and vines. **Size**: 5-8 mm. **Notes**: This species is somewhat less variable than the preceding, slightly larger on average, markings below middle of elytra narrow, not meeting at midline, and the basal markings commonly form an inverted "U" shape.

Urographis despectus (LeConte) [Fig. 317a-b]

Flight Period: May-July, ENA

Larval Feeding Habits: various hardwoods, esp. hickory. **Size**: 9-14 mm. **Notes**: somewhat similar to *Acanthocinus* species, but elytra covered with short erect bristles in this and following two species. Resembles following species but generally paler, with dark subapical markings contrasting, female with slightly broader pygidium, male abdominal tip notched, elytral tips not as concave. Attracted to UV lights.

Urographis fasciatus (DeGeer) [Fig. 316a-b]

Flight Period: April-October, ENA

Larval Feeding Habits: numerous hardwoods (also pine). **Size**: 9-15 mm. **Notes**: similar to preceding species, but darker and more mottled, female with narrower pygidium, male abdominal tip broadly concave, elytral tips distinctly concave. Attracted to UV lights.

Urographis triangulifer (Haldeman) [Fig. 315]

Flight Period: May-October, ECUS

Larval Feeding Habits: hackberry, maple. **Size**: 12-17 mm. **Notes**: generally larger than preceding pair of species, with strong, distinctive markings; dark areas on pronotum, elytral base, and along sides. Attracted to UV lights.

Tribe **Cyrtinini**

Cyrtinus pygmaeus (Haldeman) [Fig. 207]

Flight Period: March-July, EUS

Larval Feeding Habits: dry branches of numerous hardwoods, esp. oak. **Size**: 2-4 mm. **Notes**: antlike, with two acute spines arising from elytral bases (visible from side) and small pubescent patches. Possibly our smallest longhorn species.

Tribe **Saperdini**

Saperda calcarata Say [Fig. 263a-b]

Flight Period: June-September, NA

Larval Feeding Habits: live and dying poplars, willows. **Size**: 18-33 mm. **Notes**: The "Poplar Borer" is the largest species in the genus and has distinct spines at the elytral tips. The coloration is quite variable but unique, usually in pastel hues.

Saperda candida Fabricius [Fig. 279]

Flight Period: May-August, ENA

Larval Feeding Habits: living apple, crabapple, hawthorn, quince, and many related genera. **Size**: 10-21 mm. **Notes**: one of our most distinctive longhorns, the elytral stripes are sometimes briefly interrupted, but the completely white underside makes this species easily recognizable. The "Round-headed Apple Tree Borer" can be a serious pest.

Saperda cretata Newman [Fig. 278]

Flight Period: May-August, NENA

Larval Feeding Habits: living apple, hawthorn. **Size**: 15-21 mm. **Notes**: Sometimes called the "Spotted Apple Tree Borer," this attractive species is also rather distinctive; it resembles a larger version of *S. fayi*, but the white markings are larger and shaped differently. The underside is brown with white along the sides.

Saperda discoidea Fabricius [Fig. 275a-b]

Flight Period: April-September, ENA

Larval Feeding Habits: dead or dying hickory, some other hardwoods. **Size**: 9-17 mm. **Notes**: The "Hickory Saperda" is remarkably dimorphic, with very different coloration of the sexes; males have grayish, punctate elytra, pale reddish legs, and striped pronotum, while the females are distinctively brownish with irregular paler patches on the elytra and a paler pronotum. Attracted to UV lights.

Saperda fayi Bland [Fig. 277a-b]

Flight Period: May-August, NENA

Larval Feeding Habits: living branches of hawthorn. **Size**: 9-15 mm. **Notes**: closely related to *S. cretata*, the smaller, more slender form and different markings (often quite reduced in the males) make it easily recognized. The "Thorn-limb Borer" forms small galls in branches.

Saperda imitans Felt and Joutel [Fig. 273]

Flight Period: May-July, NENA

Larval Feeding Habits: various dead hardwoods, incl. hickory. **Size**: 10-16 mm. **Notes**: similar to the more common *S. tridentata*, but lacks dark elytral spots, and always has an oblique first band at elytral bases rather than sinuately transverse; the lighter, smooth powdery gray surface distinguish it from well-marked forms of *S. lateralis*.

Saperda inornata Say [Fig. 266]

Flight Period: March-July, C & ENA

Larval Feeding Habits: living poplars, willows. **Size**: 8-13 mm. **Notes**: The "Poplar-

Gall Saperda" forms small galls in branches. The uniformly gray pubescence has led to confusion with *Mecas cana saturnina* (LeConte), often incorrectly called "*M. inornata*" (below), and an even stronger resemblance to *M. cineracea*, but *Mecas* species have tarsal claws distinctly toothed and thicker antennae. Also, *S. inornata* typically has vague lateral stripes of thickened pubescence on the narrower pronotum. This feature also distinguishes the smallest individuals from *Eupogonius pubescens*, along with the lack of lateral pronotal projections, roughened pronotal surface, and tarsal lobes extending nearly to the claws (distinctly shorter than claws in *E. pubescens*).

Saperda lateralis Fabricius [Fig. 271a-c]

Flight Period: May-August, ENA

Larval Feeding Habits: various dead hardwoods and shrubs, incl. hickory (also pine). **Size**: 9-14 mm. **Notes**: The "Red-edged Saperda" is another mimic of lycid beetles, with orange longitudinal stripes on a dark body. Sometimes there are cross-stripes (form "connectens," as shown), but the uniformly dark, deeply punctate elytra make these individuals distinctive from both *S. imitans* and *S. tridentata*. Attracted to UV lights.

Saperda mutica Say [Fig. 262]

Flight Period: June-July, NENA

Larval Feeding Habits: dead willow. **Size**: 11-17 mm. **Notes**: This somewhat uncommon species has coloration unique among NE longhorns.

Saperda obliqua Say [Fig. 274]

Flight Period: June-August, ENA

Larval Feeding Habits: bases of living alder, birch. **Size**: 14-19 mm. **Notes**: distinctive brown elytra with oblique depressions, numerous punctures, and strong spines at tips. The "Alder Borer" is attracted to UV lights.

Saperda populnea moesta LeConte [Fig. 276a-b]

Flight Period: June-August, NNA

Larval Feeding Habits: living branches of poplars, willows. **Size**: 8-11 mm. **Notes**: The "Eastern Gall Saperda" forms small galls in branches. Elytra black with coarse, deep punctures and grayish hairs, females with lateral pronotal stripes. Males rather nondescript, but no other NE lamiines of similar appearance, and head and thorax different from lepturines and cerambycines.

Saperda puncticollis Say [Fig. 270]

Flight Period: May-August, ENA

Larval Feeding Habits: dead and dying Virginia creeper, grape, poison ivy. **Size**: 8-12 mm. **Notes**: The "Woodbine Borer" has attractive and unique coloration – four black spots on yellow pronotum, yellow-margined elytra.

Saperda tridentata Olivier [Fig. 272a-c]

Flight Period: April-October, C & ENA

Larval Feeding Habits: dead and dying elm. **Size**: 8-17 mm. **Notes**: The generally distinctive markings of this species may be reduced (as in Fig. 272a), but the first elytral band is always transverse and sinuate, and there are almost always basal and apical dark spots in addition to the bands, distinguishing it from both *S. imitans* and *S. lateralis*. The "Elm Borer" is common in diseased elms. Attracted to UV lights.

Saperda vestita Say [Fig. 264a-c]
Flight Period: May-September, ENA
Larval Feeding Habits: dead and dying linden. **Size**: 11-23 mm. **Notes**: The "Linden Borer" varies from largely light olive brown to grayish, with small black median spots that may fuse or vanish entirely. Even gray, unmarked individuals may be separated from *S. inornata* by the pale antennae and long white hairs on antennae and elytral tips. Attracted to lights.

Tribe **Phytoecini**

Mecas cana saturnina (LeConte) [Fig. 268]
Flight Period: April-August, CNA
Larval Feeding Habits: stems of living composites, esp. ragweed, sunflower. **Size**: 9-16 mm. **Notes**: uniformly gray, has often been confused with *Saperda inornata*, but has two dark spots on pronotum (which also distinguish it from following species). This and the following species are further distinguished from *S. inornata* by toothed tarsal claws, visibly thicker antennae, and broader prothorax.

Mecas cineracea Casey [Fig. 267]
Flight Period: April-August, SNA
Larval Feeding Habits: stems of living composites. **Size**: 6-11 mm. **Notes**: small species with uniformly pale pubescence, barely extending into our region in Missouri, and south into Mexico. An almost identical, slightly larger species, *M. confusa* Chemsak and Linsley, occurs in Kansas and might occur farther east (distinguished by having all tarsal claw teeth of equal length).

Mecas pergrata (Say) [Fig. 269]
Flight Period: April-July, C & SEUS
Larval Feeding Habits: stem/root borers of wild asters, other composites. **Size**: 6-12 mm. **Notes**: The five small, shining spots on pronotum, reddish femora, and gray elytra with narrow yellowish margins make this species easily recognized.

Oberea affinis Leng and Hamilton [Fig. 250]
Flight Period: June-July, ENA
Larval Feeding Habits: stem borer of living blackberry, raspberry. **Size**: 10-16 mm. **Notes**: a rather dark species, similar to *O. perspicillata*, but the two pronotal calli are usually pale, while there is a dark basal spot and a broad dark triangle on the side, running from the foreleg bases to the back of the head. For those rare specimens with dark pronotal calli, further diagnostic features are that the pronotum has somewhat stronger basal and apical creases than in *perspicillata*, the hairs on the body and elytra are dark, and the last male sternite is deeply concave with a strongly emarginate posterior margin.

Oberea caseyi Plavilstshikov [Fig. 245a-b]
Flight Period: May-August, ENA
Larval Feeding Habits: willow. **Size**: 9-12 mm. **Notes**: The status of this species is somewhat uncertain presently. There are no major structural differences to distinguish it from *O. schaumii*, but it apparently occurs only on willow and exhibits very consistent differences in coloration, as well as smaller average size. The body is largely yellowish

to reddish, with dark antennae, four pronotal calli, tarsi, and thorax beneath slightly darkened. Typically, almost the entire elytral surface is pale except for the black humeri, somewhat resembling *O. pruinosa* (in which, if the humeri are dark, the midline at the base is also dark). However, individuals of *caseyi* (and *schaumii*) have more slender femora than *pruinosa*, with only a thin covering of pubescence, the pronotum is narrower at the front than at the base (broadest in the middle), with less appressed pubescence and smaller posterior spots, and the head in both sexes is not quite as broad and hairy as in *pruinosa*. The elytral apices are more distinctly truncate, the abdomen is typically entirely pale beneath, with the final male sternite more shallowly excavated and more evenly arcuate (rather than emarginate), and the corresponding swelling on the female pygidium forms a much less protruding, blunter cone. On the specimens I have examined, this projection is slightly less convex dorsally, and with the declivity beneath the apex smaller than in *schaumii* females, but this is rather subtle. Sometimes the humeral markings extend to form lateral stripes (Fig. 245b) as seen in *O. gracilis*, but the four dark pronotal calli and darker antennae easily distinguish *caseyi* from that species.

Oberea deficiens Casey [Fig. 259a-b]

Flight Period: May-July, NENA

Larval Feeding Habits: viburnum. **Size**: 10-14 mm. **Notes**: The status of this uncommon species is rather uncertain presently. No obvious structural differences distinguish this from *O. praelonga* or *O. ulmicola*, but it apparently occurs only on viburnum and exhibits consistent differences in coloration, more closely resembling *O. myops* in that respect, and the palest specimens of *O. tripunctata*. It is almost entirely yellowish, with a darkened median basal pronotal spot (occasionally absent), pale scutellum and legs (legs distally blackened in *myops*), dark spots above the forecoxae (Fig. 259b; always absent in *myops*), and metepisternum always black. The metasternum, however, is often pale ventrally, and if any sternites are darkened, it is only sternites 2 and/or 3 (the underside is thus quite similar to *myops*, though on average the dark markings are slightly more extensive). Females always have the last abdominal sternite and tergite entirely pale, while in *praelonga* these are always dark. The elytra vary from almost entirely pale to having dark lateral stripes, and the antennae are dark at the base and gradually become lighter (rarely with the apical segments banded). The heart-shaped concavity on the final male sternite of this species is quite different from the almost hemispherical one seen in *myops*.

Oberea delongi Knull [Fig. 254]

Flight Period: May-August, NENA

Larval Feeding Habits: living cottonwoods. **Size**: 7-13 mm. **Notes**: The “Poplar Twig Borer” is variable but easily recognized. It is mostly black, but pronotum yellow-orange anteriorly (at least ventrally), with variable amount of black at middle dorsally (at least surrounding calli, of which there are actually four) and at base; yellow-orange legs and head (sometimes dark on vertex), abdomen dark with yellow apex, epipleural margin briefly yellow. Elytral and pronotal pubescence weak.

Oberea erythrocephala* (Fabricius) [Fig. 243]

Flight Period: April-July, NUS

Larval Feeding Habits: stems of leafy spurge (*Euphorbia esula*). **Size**: 9-11 mm. **Notes**: generally dark gray (including pronotum) with yellow-orange legs and reddish head, a few reddish marks ventrally, no pronotal calli. Elytral and pronotal pubescence dense, obvious. European species intentionally introduced to control leafy spurge, now established in several areas (mostly western), but has been released elsewhere and should soon (if not already) be encountered in the East.

Oberea flavipes Haldeman [Fig. 253]

Flight Period: May-July, NENA

Larval Feeding Habits: stem borer of living phlox. **Size**: 7-11 mm. **Notes**: The combination of entirely dark head, antennae, thorax, and body with yellow legs (elytra dark brownish) makes this slender species distinctive (but see under *O. tripunctata*). Occasionally the epipleura are yellowish. One of the smallest and least common species in the genus.

Oberea gracilis (Fabricius) [Fig. 248]

Flight Period: April-August, EUS

Larval Feeding Habits: girdlers of young oaks. **Size**: 10-15 mm. **Notes**: Orange pronotum without calli and orange elytra with well-defined dark lateral stripes and distinct punctures make this species one of the most distinctive in the genus. Recently dubbed the "Oak-sprout Oberea."

Oberea myops Haldeman [Fig. 257a-b]

Flight Period: May-July, ENA

Larval Feeding Habits: branches of living blueberry, rhododendron, laurel, and related genera. **Size**: 9-18 mm. **Notes**: the "Rhododendron Stem Borer" typically has the body mostly pale, elytra pale but darkened laterally, antennae entirely dark (rarely paler apically), metepisternum always dark, but metasternum usually pale ventrally. If any sternites are darkened, it is only sternites 2 and/or 3, and legs distally darkened, especially hind legs. It can be very difficult to separate from *O. deficiens*, at least the females; the lack of a ventral pronotal spot (Fig. 257b) will usually distinguish it, as will the legs and antennae (generally also the absence of posterior pronotal spot). The concavity of the last male sternite, however, is deep and nearly hemispherical rather than heart-shaped.

Oberea ocellata Haldeman [Fig. 255]

Flight Period: April-September, EUS

Larval Feeding Habits: branches of living sumac, other hardwoods, incl. apple. **Size**: 11-17 mm. **Notes**: The "Sumac Stem Borer" is easily recognized by its reddish head (never entirely dark), thorax, body, and femora, while the pronotum has two dark calli, the legs are distally darkened, and the elytra are covered with fine gray pubescence. Coastal and southeastern specimens tend to have the upper surfaces of the head and thorax darkened (form "discoidea"), though the remainder is reddish, unlike similarly colored forms of *O. delongi* (which also have much weaker pubescence and four calli). It is most reliably separated from *O. ulmicola* by the slightly broader form, darker antennae, elytra, tibiae and tarsi, smaller lower eye lobes, and reddish head; the female pygidial projection and corresponding male sternal concavity are also slightly less developed.

Oberea oculaticollis (Say) [Fig. 244]

Flight Period: May-July, CNA

Larval Feeding Habits: ? **Size**: 9-13 mm. **Notes**: The entirely dark body with dense silvery-gray pubescence and dark appendages is distinctive. Rarely the antennae and elytra may tend towards brownish coloration distally.

Oberea pallida Casey [Fig. 249]

Flight Period: May-September, NENA

Larval Feeding Habits: alder branches. **Size**: 10-14 mm. **Notes**: This uncommon species has recently been treated as a synonym of *O. praelonga*, but apparently occurs exclusively on a different host plant and exhibits distinct differences in coloration and structure (such as the relatively weak swelling on the female pygidium), so I retain it as a separate species here. The entire body, including appendages, is usually rusty yellow to reddish-brown, though often the pronotal calli, antennal scape, and some sternites are slightly darkened (rarely black). The elytra, including humeri, always lack dark markings, and tend to have more acute outer apices than other species.

Oberea perspicillata Haldeman [Fig. 251]

Flight Period: April-August, ENA

Larval Feeding Habits: stem borer of living blackberry, raspberry, rose. **Size**: 8-15 mm. **Notes**: The "Raspberry Cane Borer" is a common and somewhat variable species, and there has been considerable confusion as to its identity in the past; it may still represent more than a single true species. Generally, it is best recognized by being almost completely black, with the pronotum orange except for the two black calli, a basal black margin (occasionally reduced to a spot as in *O. affinis*), and a small lateral mark near the foreleg bases. Occasional specimens (form "exilis") have the legs and apical antennal segments brown (or partially yellowish), and with weak yellowish markings at the elytral bases and epipleural margins, but the more slender body and dark pronotal base separates these from the dark forms of *O. tripunctata*. It is further distinguished from *affinis* by the lack of strong basal and apical pronotal creases, generally pale pubescence, which give the body and elytra a grayish cast, and the very shallow concavity of the last male sternite.

Oberea praelonga Casey [Fig. 258a-b]

Flight Period: May-July, NENA

Larval Feeding Habits: dogwood. **Size**: 8-16 mm. **Notes**: The status of this species is also rather uncertain presently, though the evidence is good that it occurs only on dogwood, and it exhibits consistent differences in coloration from both *O. deficiens* and *O. ulmicola*, often more closely resembling *O. tripunctata*, from which it differs structurally. It has much or all of the head dark (typically with a pale "collar"), with a darkened median basal pronotal spot (occasionally absent), pale scutellum, legs usually pale but sometimes slightly darkened distally, large dark spots above the forecoxae, metepisternum always black, and metasternum usually dark ventrally (Fig. 258b), and sternites 2 and/or 3 are usually darkened, while 1 and 4 are at least partially pale. Females always have the last abdominal sternite and tergite largely black, while in *deficiens* these are always pale. The elytra vary from almost entirely pale to dark with weak pale stripes, and the antennae are dark at the base and gradually become lighter (occasionally with the apical segments banded as seen in *tripunctata*). The underside reliably serves to distinguish this from *ulmicola*, but is not as dark as in *tripunctata*, from which it further differs by the pale scutellum, the mandibular shape, and the apex of the last female sternite distinctly concave. Rarely specimens may have the head entirely pale as is typical of *tripunctata*, and males of this form are virtually indistinguishable from *deficiens*, though if the more extensive dark markings are present (or host data is known), a few of these can still be recognized.

Oberea pruinosa Casey [Fig. 246a-c]

Flight Period: May-July, NENA

Larval Feeding Habits: girdlers of living branches of cottonwood. **Size**: 10-16 mm. **Notes**: This species is closely related to *O. caseyi* and *O. schaumii* but is usually easily distinguished, though extreme color variants of these species can be more difficult to separate. Typical coloration in *pruinosa* is largely brownish-yellow, with large spots on the posterior pair of pronotal calli, dark markings on the vertex of the head, the base of the elytra at the midline, the elytral apices, and often the humeri. Rarely the elytral markings are elongated and expanded to form stripes, or fusing so almost the entire elytral surface is dark (form "cylindricollis"; Fig. 246b), as in *schaumii*, or reduced similar to *caseyi*. However, individuals of *pruinosa* always have much broader femora than either of these species, with a thicker covering of pubescence, while the pronotum is as broad at the front (forming a "collar") as at the base and pubescent, the posterior pronotal spots are larger, and the head in both sexes is relatively broad and hairy. The elytral apices are not as truncate, the first two or three abdominal sternites are almost entirely dark, and the abdominal apices are quite different, with the final male sternite more deeply excavated and emarginate apically; the corresponding swelling on the female pygidium is produced into a very strongly projecting, tapering cone (Fig. 246c).

Oberea ruficollis (Fabricius) [Fig. 242]

Flight Period: May-August, ENA

Larval Feeding Habits: borer in stems and roots of living sassafras and spicebush. **Size**: 15-21 mm. **Notes**: The "Sassafras Borer" is the largest member of the genus in the NE, distinctively colored with body, head, and prothorax reddish-orange, including four pronotal calli (pale and punctate instead of dark and shining), and gray elytra.

Oberea schaumii LeConte [Fig. 247a-b]

Flight Period: May-July, ENA

Larval Feeding Habits: girdlers of living branches of poplars, aspen. **Size**: 8-17 mm. **Notes**: The "Poplar Branch Borer" is very similar to *O. caseyi* and *O. pruinosa* in having four dark pronotal calli, but typical coloration in *schaumii* is largely reddish-yellow, with most of the elytral surface dark except the extreme lateral margins, and sometimes some very faint pale dorsal stripes (as in Fig. 247b). The posterior pronotal spots are smaller than in *pruinosa*, and occasionally individuals also have the head darkened. The abdomen is typically entirely pale or reddish beneath, but if the first three sternites are darkened at all, they usually have pale borders. Structural differences between this and *pruinosa* are the same as those listed above for *caseyi*, and appear quite reliable for separating the species.

Oberea tripunctata (Swederus) [Fig. 252a-e]
Flight Period: May-August, ENA
Larval Feeding Habits: borers in living branches of dogwood, occasionally other hardwoods or shrubs, incl. elm. **Size**: 8-13 mm. **Notes**: This species has many color variants, but there is one structural feature that can be seen with a microscope that infallibly separates it from all other species: the mandibles are relatively elongated, with the outer margin rather straight, abruptly incurving very near the apex (Fig. 252b), whereas all other species have the mandibles broader, with the outer margin evenly curved. The "Dogwood Twig Borer" usually has a pale head and thorax, a dark spot at the middle of the pronotal base, always has a dark scutellum, the legs are pale, and at least the apical antennal segments banded rather than a uniform color (the elytra vary from mostly pale to mostly dark, but are typically strongly striped). The underside of the body, including prothorax, is almost competely dark (Fig. 252e; often sternite 4 and/or 5 of males is pale), and females have the last sternite flattened apically, but not distinctly concave. This combination of features generally allows for reliable separation of this species, though occasional specimens can be found that have the head or elytra largely dark, as shown in Fig. 252a; anything of this general appearance with a dark scutellum or entirely dark underside is *tripunctata*. Rare extreme forms exist (seen from Canada; Fig. 252c) that are almost entirely dark except for the pale legs; such individuals can be separated from *O. flavipes* by the broader pronotum and denser covering of erect elytral hairs, as well as the very different mandibular shape.

Oberea ulmicola Chittenden [Fig. 256a-b]
Flight Period: May-July, NENA
Larval Feeding Habits: elm, sometimes cherry. **Size**: 9-14 mm. **Notes**: Recognition of this species relative to others in the genus, particularly *O. praelonga*, is still uncertain. Aside from the apparent difference in hosts and consistent color differences, there are no evident structural differences. This species has most or all of the head dark (typically with a pale "collar"), pronotum often with a dark median basal spot or ventral spot, elytra generally dark with some pale areas basally (sometimes extends into striping, but never well-defined), scutellum and legs pale, antennae dark at the base, typically becoming gradually paler (sometimes wholly dark, but not banded), and the underside of the body largely or entirely pale (metepisternum *never* black, though sometimes there is darkening of ventral metasternum and/or sternites 2 and 3 as in Fig. 256b). The coloration of the underside reliably allows separation of this and *praelonga*, and readily distinguishes this from *O. tripunctata* (also the pale scutellum and mandibular shape). Features distinguishing it from *O. ocellata* are listed under that species.

Tribe **Tetraopini**

?Phaea canescens (LeConte) [Fig. 240]
Flight Period: June-July, CUS
Larval Feeding Habits: alder. **Size**: 9-12 mm. **Notes**: head and pronotum orange with dark, hairy, mid-pronotal callus, elytra strongly punctate with dense gray pubescence. Slightly larger and more robust than following species. Known from Kansas, potentially occurring eastward.

Phaea monostigma (Haldeman) [Fig. 241]
Flight Period: May-July, EUS
Larval Feeding Habits: living stems of morning-glory. **Size**: 7-10 mm. **Notes**: head and pronotum reddish, callus variably darkened, elytra with black pubescence, slightly smaller and more slender than preceding species.

*?**Tetraopes annulatus*** LeConte [Fig. 233]
Flight Period: May-August, CNA
Larval Feeding Habits: various milkweeds. **Size**: 8-16 mm. **Notes**: somewhat densely gray pubescent, with a broad, weakly prominent glabrous mid-pronotal callus and relatively wide pale antennal rings; the elytral tips are often darkened. Recorded from within a few miles of geographic boundaries defined for this guide, apparently restricted to areas with sandy, upland soils, as is the similar *T. pilosus.*

*?**Tetraopes discoideus*** LeConte [Fig. 238]
Flight Period: July-October, SCUS
Larval Feeding Habits: *Asclepias verticillata*. **Size**: 5-10 mm. **Notes**: similar to *T. melanurus*, but smaller, with dark pronotum, pronotal callus fairly well-defined and pubescent, and dark markings on the otherwise red head. Known as far east as eastern Kansas, west into Arizona, and south into Guatemala.

Tetraopes femoratus LeConte [Fig. 235]
Flight Period: May-October, C &WNA
Larval Feeding Habits: various milkweeds. **Size**: 8-19 mm. **Notes**: best distinguished from other species by its mid-pronotal callus, which is elongate and flat-topped with abrupt and almost parallel lateral edges. The distribution is unusual, covering virtually all of North America except the Atlantic Coast, and there is some variation in the appearance of different populations, though they all seem to be the same species.

Tetraopes melanurus Schönherr [Fig. 237a-b]
Flight Period: May-September, EUS
Larval Feeding Habits: butterflyweed (*Asclepias tuberosa*). **Size**: 7-12 mm. **Notes**: pronotum with very weak medial callus (as in *T. quinquemaculatus*), elytra with distinctive broad dark markings in addition to spots, at least apically and typically medially; has entirely dark, unringed antennae as in *T. tetrophthalmus.*

*?**Tetraopes pilosus*** Chemsak [Fig. 232]
Flight Period: June-August, CUS
Larval Feeding Habits: butterflyweed (*Asclepias tuberosa*), and *A. arenaria*. **Size**: 11-17 mm. **Notes**: very similar to *T. annulatus*, but body surface including callus completely obscured by dense whitish or yellowish-gray pubescence.

Tetraopes quinquemaculatus Haldeman [Fig. 239]
Flight Period: June-September, CNA
Larval Feeding Habits: *Asclepias hirtella*. **Size**: 8-12 mm. **Notes**: separated from most other species by having elytra without basal spots and a very weak median callus. Since it typically has slight dark markings at the elytral tips, it can be confused with unusually pale *T. melanurus* forms in areas where the species overlap, but is separated by the slightly ringed antennae, the smaller posterior elytral spots (these generally broad in

melanurus), and the dark humeral spots that are sometimes lacking in *melanurus.*

Tetraopes tetrophthalmus (Forster) [Fig. 236a-b]

Flight Period: May-September, C & ENA

Larval Feeding Habits: various milkweeds (esp. *Asclepias syriaca*), dogbane. **Size**: 8-15 mm. **Notes**: The combination of broad, disc-like pronotal callus, unringed antennae, and strong elytral spots (subhumeral spots present and often quite large) distinguish this species. The "Red Milkweed Beetle" is common and widespread east of the Rockies.

Tetraopes texanus Horn [Fig. 234]

Flight Period: April-August, SCUS

Larval Feeding Habits: green milkweed (*Asclepias viridiflora*). **Size**: 11-17 mm. **Notes**: The antennae, with their long tufts of dark hair (grouped together at the tip of each segment, as opposed to the usual shorter fringe hairs seen in other species, such as *T. femoratus*) and unusual curved, elongate tips, are very distinctive. Range extends into Missouri.

*****Tetrops praeusta*** Linnaeus [Fig. 226]

Flight Period: May-July, NEUS

Larval Feeding Habits: various hardwoods and shrubs, esp. apple, hawthorn. **Size**: 4-6 mm. **Notes**: This European species has been collected at scattered localities in the NE and may now be established in NA, so it is included here. The appearance is distinctive; very small, cylindrical, with black body and black-tipped pale orange-brown elytra.

Tribe **Hemilophini**

Hemierana marginata ardens (LeConte) [Fig. 229]

Flight Period: April-August, EUS

Larval Feeding Habits: ironweed, puccoon. **Size**: 6-11 mm. **Notes**: This subspecies is a mimic of lycid beetles (other subspecies of *marginata* more resemble Lampyridae, with more grayish elytral pubescence and pale pubescence along margins; this species is probably in need of more detailed taxonomic research), with fringed antennae. Resembles *Eupogonius subarmatus*, but the antennal scape is thicker, there are no lateral pronotal projections, and the orange markings sometimes extend onto the humeri.

APPENDIX: Status of Some Northeastern *Oberea* Species*

I have examined the type material of several species of *Oberea*, and I propose two new synonymies, restore several species presently considered synonymized (Linsley and Chemsak 1995) to their former status, and designate lectotypes for four of Casey's species for which there were syntypic series (*O. ferruginea*, *O. pallida*, *O. praelonga*, and *O. pruinosa*). Though the specimens were labeled "types" by Buchanan, these designations have not been validated until now (P. Spangler, pers. comm.). Only single specimens are so designated for *O. cylindricollis* and *O. deficiens*, so no confusion is possible as to which are the types. This genus is clearly in need of an exhaustive revision, and this appendix is an attempt to help clarify a few troublesome issues for purposes of this field guide, and to alert other researchers to the problems. Accordingly, I am conservative in my recognition of two of the following species, *O. caseyi* and *O. deficiens*, for which only host plants and coloration appear to separate them from related species. It is evident from structural features, at least, that *O. caseyi* and *O. schaumii* are closer to one another than either is to *O. pruinosa*, while *O. deficiens*, *O. praelonga*, and *O. ulmicola* are more similar to one another than any are to *O. pallida*, and farther removed still from *O. tripunctata*. The format for listings of synonymies follows that of Linsley and Chemsak (1995).

Oberea caseyi Plavilstshikov

Oberea ferruginea Casey, 1913, Memoirs on the Coleoptera 4:366 (preocc.)
Oberea caseyi Plavilstshikov, 1926, Encyclopedie Entomologique (B)2, Coleoptera 1:64
Oberea canadensis Fisher, 1945, Canadian Entomologist 77:56 NEW SYNONYMY
Oberea quadricallosa: Linsley and Chemsak, 1995, University of California Publications in Entomology 114:226 (misidentified in part)
Oberea schaumi: Linsley and Chemsak, 1995, University of California Publications in Entomology 114:229 (misidentified in part); Downie and Arnett, 1996, The beetles of northeastern North America, p. 1275 (misidentified in part)
Oberea myops: Linsley and Chemsak, 1995, University of California Publications in Entomology 114:244 (misidentified in part); Downie and Arnett, 1996, The beetles of northeastern North America, p. 1276 (misidentified in part)
Lectotype male: Kan./Casey bequest 1925/TYPE USNM 36358/ferruginea Csy./ Lectotype male Oberea ferruginea Csy. D. Yanega 1996

After examining Casey's and Fisher's type specimens and additional material, *O. caseyi* is removed from synonymy with *O. schaumii* LeConte, and *O. canadensis* is removed from synonymy with *O. myops* Haldeman. *O. caseyi* occurs on *Salix* spp., and always has four pronotal calli. Linsley and Chemsak (1995) considered Keen's (1938,

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*While I recognize that lectotype designations are most appropriately published in journals, the discovery that such designations were needed here occurred only a short time before this field guide was scheduled to go into production, and it was not possible to guarantee publication in a journal in advance of the field guide's release. I thank Serge Laplante of Agriculture Canada for bringing these problems to my attention.

1952) identification of *O. ferruginea* to be in error, listing it instead under *O. quadricallosa* LeConte; however, this was apparently based on the presumption that Colorado was outside of the range of *O. schaumii*, and the only western species with four pronotal calli known was *O. quadricallosa*. I have seen a specimen of *O. caseyi* from New Mexico, which clearly indicates that this species occurs in the West, and thus I presume Keen's record of *O. ferruginea* from *Salix* in Colorado to be valid, and therefore remove *O. ferruginea* from synonymy with *O. quadricallosa*. In addition to features noted in the species synopses, the largest specimens of *O. caseyi* do not approach the size of typical *O. schaumii* (from either the same or different areas) in the material examined. I have been informed (Serge Laplante, pers. comm.) that *O. schaumii* have been collected alongside normal *O. caseyi* on *Salix* in Quebec, but I do not consider this sufficient evidence to reduce the latter species to synonymy, preferring to interpret this as an unusual host record for *O. schaumii*. Until there is more definitive evidence, I believe it is wisest to retain *O. caseyi* as a separate species.

Oberea deficiens Casey

Oberea praelonga deficiens Casey, 1924, Memoirs on the Coleoptera 11:296
Oberea deficiens: Hicks, 1962, Coleopterists Bulletin 16:9
Oberea tripunctata: Linsley and Chemsak, 1995, University of California Publications in Entomology 114:242 (misidentified in part); Downie and Arnett, 1996, The beetles of northeastern North America, p. 1276 (misidentified in part)

After examining the type specimen and additional material, this species is removed from synonymy with *O. tripunctata*. It should be noted that Linsley and Chemsak (1995) do not mention Hicks' (1962) listing of *O. deficiens* as a full species; the present recognition of *O. deficiens* as a species, therefore, does not constitute a "new status." This species occurs on *Viburnum* spp.; it may possibly prove to be a color morph of *O. praelonga* Casey, if this apparent host specificity is not genuine, but it is unquestionably not a form of *O. tripunctata*, with numerous structural differences including the normal mandibles and features of the female abdominal apex (see synopses). It is accorded species status here rather than subspecies because it is evidently sympatric with *O. praelonga*.

Oberea pallida Casey

Oberea pallida Casey, 1913, Memoirs on the Coleoptera 4:366
Oberea praelonga: Linsley and Chemsak, 1995, University of California Publications in Entomology 114:246 (misidentified in part); Downie and Arnett, 1996, The beetles of northeastern North America, p. 1276 (misidentified in part)
Lectotype male: C.A. Frost, Monmouth VI-22-09 Me./Casey bequest 1925/TYPE USNM 36355/pallida Csy./Lectotype male Oberea pallida Csy. D. Yanega 1996

After examining the type specimens and additional material, this species is removed from synonymy with *O. praelonga*. This species occurs on *Alnus* spp., and the structure of the male and female abdominal apices, along with other features as described in the species synopses, readily separates this species.

Oberea praelonga Casey

Oberea praelonga Casey, 1913, Memoirs on the Coleoptera 4:368

Oberea tripunctata: Dillon and Dillon, 1961, A manual of common beetles of eastern North America, p. 654, pl. 65, #13 (misidentified in part); Johnson and Lyon, 1988, Insects that feed on trees and shrubs, p. 262, pl. 123B (misidentified in part); Solomon, 1995, U.S.D.A. Forest Service agriculture handbook 706:374, Fig. 147A (misidentified in part)

Lectotype male: N.Y./Casey bequest 1925/TYPE USNM 36362/praelonga Csy./ Lectotype male Oberea praelonga Csy. D. Yanega 1996 [specimen has broken right antenna]

All specimens examined of this species list *Cornus* spp. as host plant. Several good structural features, most notably the mandibles, and consistent coloration features distinguish it from *O. tripunctata*, which shares the same host (see synopses). It is evident from the illustrations in Dillon and Dillon, Johnson and Lyon, and Solomon that these authors were examining material of *O. praelonga*; from the descriptions and host ranges listed, it also appears that they were including records of *O. deficiens* and *O. ulmicola* as well, but this cannot be determined with certainty. Clearly, this species group has been badly confused by researchers in the past, but the discovery of the unusual shape of the mandibles in *O. tripunctata* (Serge Laplante, pers. comm.) greatly clarifies the situation. It is evident that at least two quite distinct and widespread species regularly feed in *Cornus* in eastern North America.

Oberea pruinosa Casey

Oberea pruinosa Casey, 1913, Memoirs on the Coleoptera 4:365

Oberea quadricallosa cylindricollis Casey, 1924, Memoirs on the Coleoptera 11:295 NEW SYNONYMY

Oberea schaumi: Linsley and Chemsak, 1995, University of California Publications in Entomology 114:229 (misidentified in part); Downie and Arnett, 1996, The beetles of northeastern North America, p. 1275 (misidentified in part)

Lectotype female: St. L., Mo./Casey bequest 1925/TYPE USNM 36357/pruinosa Csy./ Lectotype female Oberea pruinosa Csy. D. Yanega 1996 [specimen has broken right antenna]

After examining considerable material, including the types of each, *O. pruinosa* and *O. cylindricollis* are removed from synonymy with *O. schaumii*. It remains to be seen whether Breuning's (1962) "*O. schaumi* v. *subcylindricollis*" and "*O. schaumi* v. *vittipennis*" are also synonymous with *O. pruinosa*, though it seems likely. This species occurs on *Populus* spp., as does *O. schaumii*, but the structure of the male and female abdominal apices, along with numerous other features, such as the robust femora, dense pubescence, and broad head and prothorax, easily separates this species, even those color morphs (e.g., *cylindricollis*) that superficially resemble *O. schaumii*. It is apparent from the descriptions in many texts and journal articles that most authors believe there are only two eastern poplar-feeding *Oberea* (*O. delongi* Knull and *O. schaumii*), *O. pruinosa* having been considered nothing more than a color variant of the latter; however, there appears to be three distinct species and a fourth related species (*O. caseyi*) exclusively on *Salix*. The confusion between the beetle species by most authors makes definitive statements of host associations with different *Populus* species slightly questionable, but the report of Hicks (1962) suggests that *O. pruinosa* may be restricted to *P. deltoides* and its relatives (as is *O. delongi*), while *O. schaumii* may feed on *P. tremuloides* and related species, and rarely on *Salix*.

Oberea ulmicola Chittenden

Oberea ulmicola Chittenden, 1904, *in* Webster, Bulletin of the Illinois State Laboratory of Natural History 7:1

Oberea bimaculata: Johnson and Lyon, 1988, Insects that feed on trees and shrubs, p. 262, (misidentified in part?)

Oberea ocellata: Linsley and Chemsak, 1995, University of California Publications in Entomology 114:233 (misidentified in part); Downie and Arnett, 1996, The beetles of northeastern North America, p. 1275 (misidentified in part)

After examining the type specimen, numerous paratypes, and additional material, this species is removed from synonymy with *O. ocellata* Haldeman. This species occurs on *Ulmus* spp. and *Prunus* spp. While it is almost identical in structure to *O. praelonga* (aside from different hosts and consistent coloration differences), it is unquestionably not a form of *O. ocellata*, with numerous structural differences including the size of the lower eye lobes and features of the abdominal apices, as discussed in the species synopses. Johnson and Lyon (1988) list *O. ulmicola* as a synonym of "*O. bimaculata*" (= *perspicillata* Haldeman), apparently following Breuning's (1962) designation of "*O. bimaculata* v. *ulmicola*"; it is unclear what material Breuning was referring to, but Johnson and Lyon list hosts as "hickory, dogwood, and black cherry," which suggests that at least in part they were referring to *O. ulmicola* as recognized by Chittenden (likely also referring to *O. praelonga*), and certainly not "*O. bimaculata*" in any sense, which occurs only on *Rubus* and *Rosa*.

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